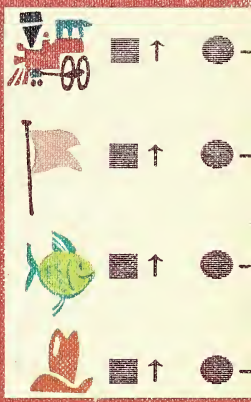

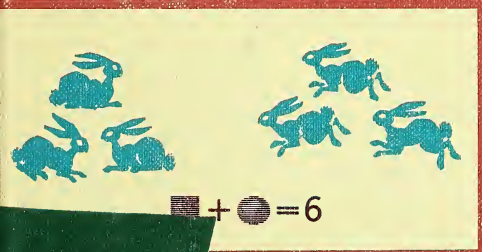

Seeing through arithmetic

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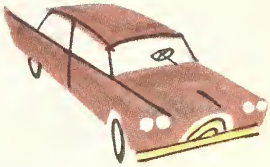

Seeing through arithmetic 1

by Maurice L. Hartung, Henry Van Engen, E. Glenadine Gibb,

James E. Stochl, Lois Knowles, and A. B. Evenson

W. J. Gage Limited

Toronto

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This is the first book of The Basic Mathematics Program, which is a unit of THE CURRICULUM FOUNDATION SERIES, published by Scott, Foresman and Company, and edited for use in Canadian schools by W. J. Gage Limited.

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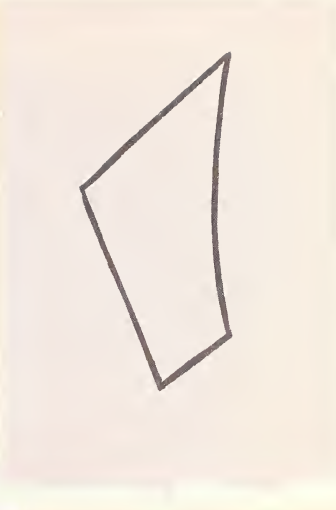
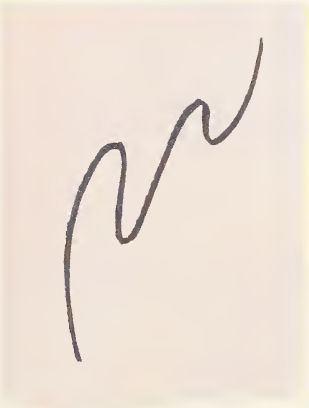
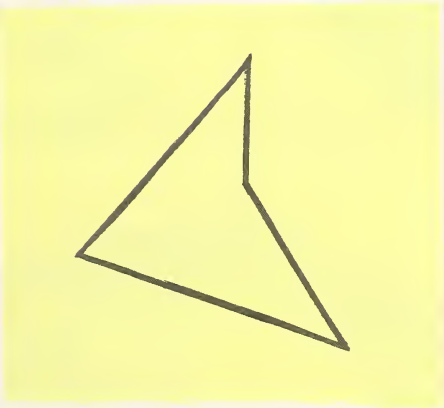
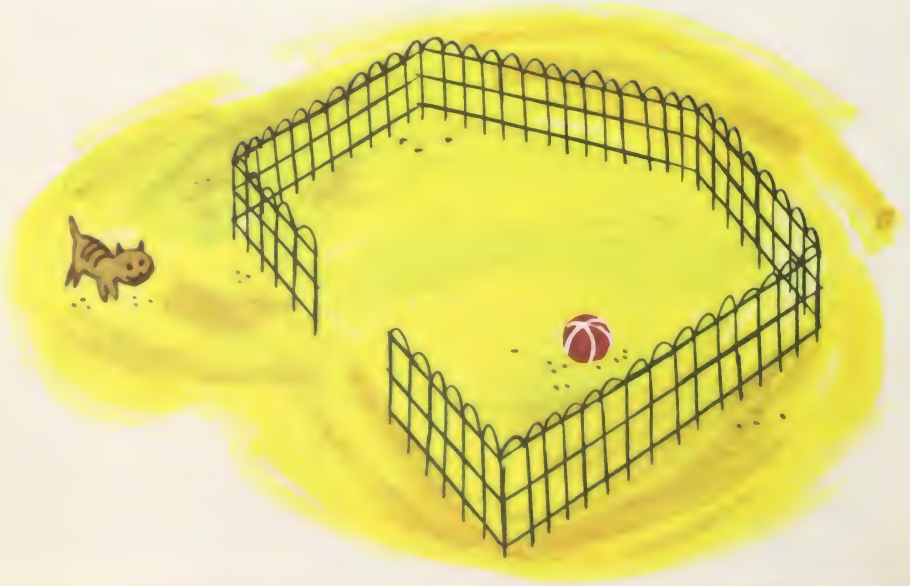
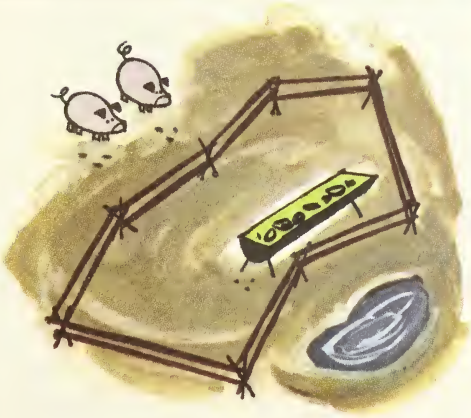
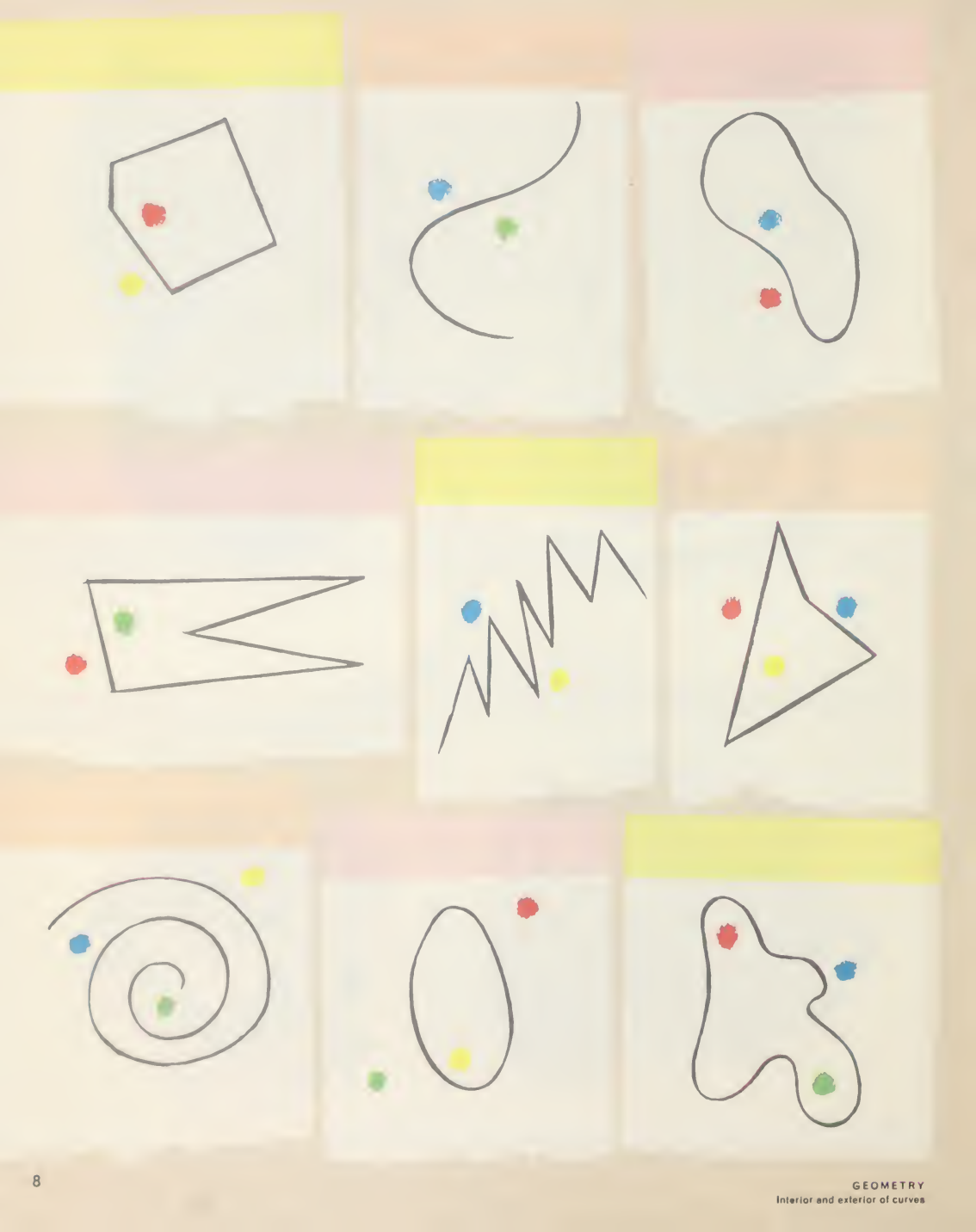
See page 160 for a complete index of the mathematical ideas presented in this book.

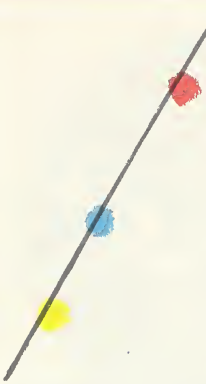




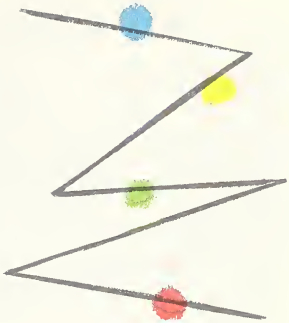
GEOMETRY
Closed and open curves

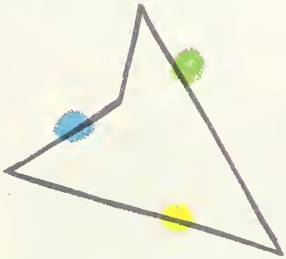


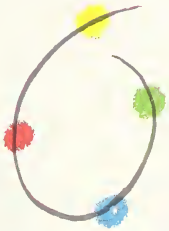


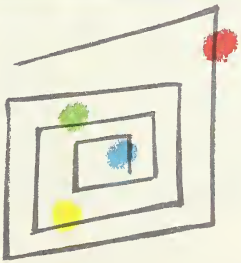


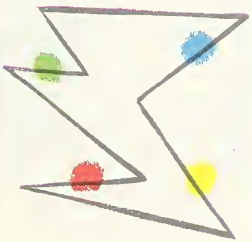


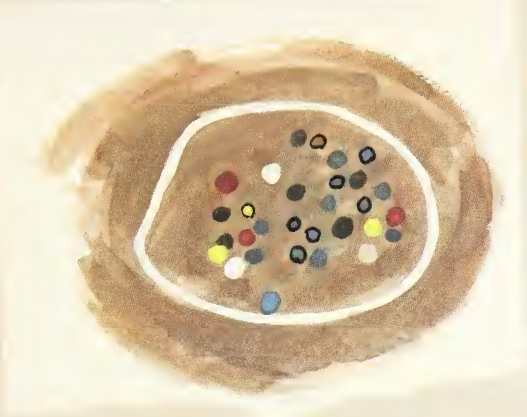


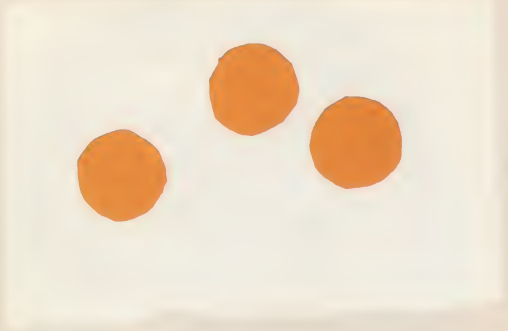


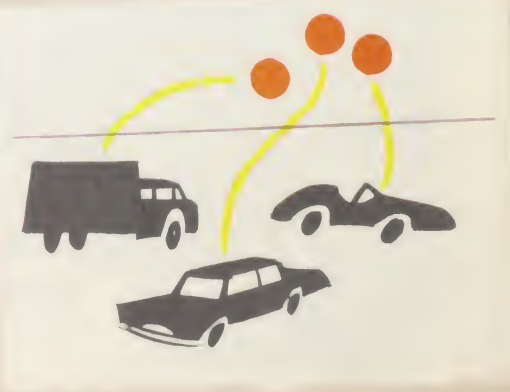






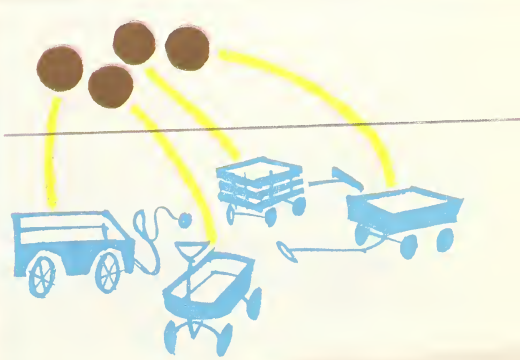






CARDINAL IDEA OF NUMBER

The number 3—determining equivalence; matching; oral use of the word "three"



CARDINAL IDEA OF NUMBER

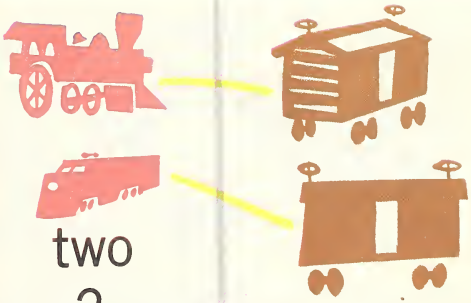
The numbers 1 and 2—determining equivalence; matching; oral use of the words "one" and "two"

four three one two 3 2 1 4

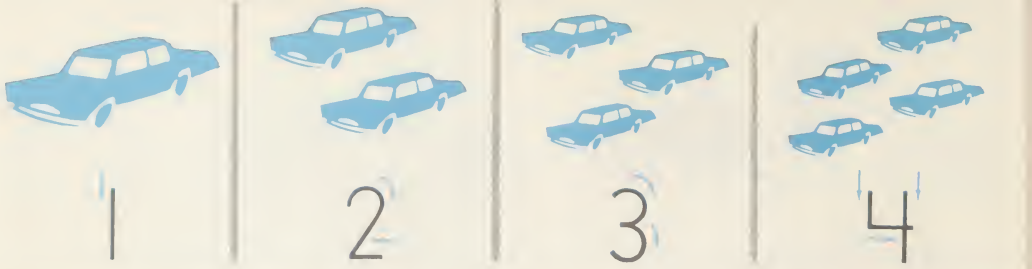
three
3

one
1

four
4



two
2



- one
- three
- four
- two

4 ●
2 ●
1 ●
3 ●

- two
- one
- three
- four

1 ●
3 ●
2 ●
4 ●

- three
- two
- four
- one

1 ●
4 ●
3 ●
2 ●

- four
- one
- two
- three

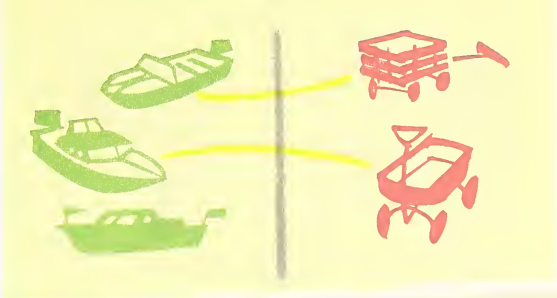
3 ●
2 ●
4 ●
1 ●

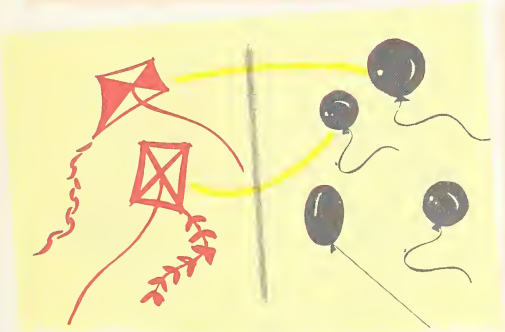
- two
- one
- three
- four

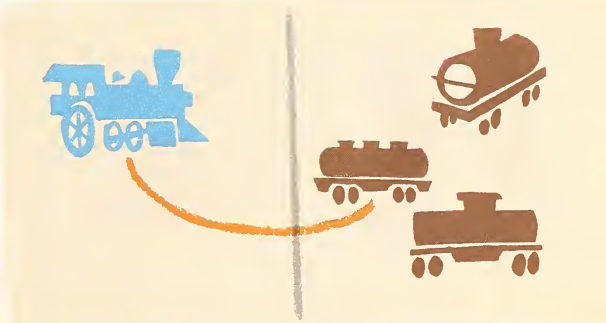
4 ●
3 ●
2 ●
1 ●

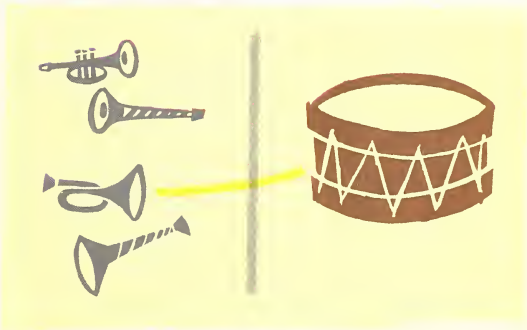
- one
- four
- two
- three

2 ●
1 ●
3 ●
4 ●



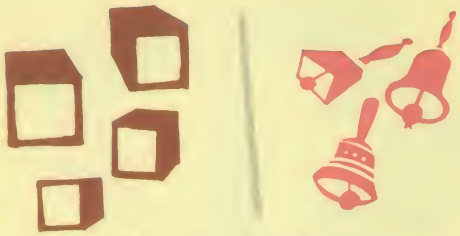




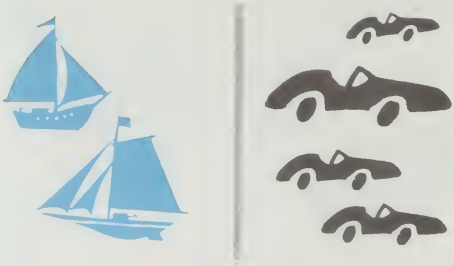


CARDINAL IDEA OF NUMBER

Ideas of "greater than" and "less than"; oral use of the words "is greater than" and "is less than"



4 is greater than 3.



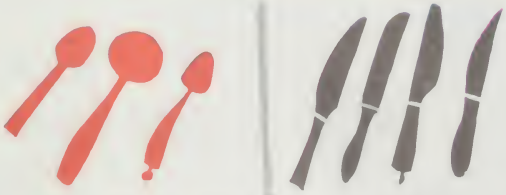
4 is greater than 2.

■ is greater than 1.

3 is greater than ■.

■ is greater than ●.

■ is greater than ●.

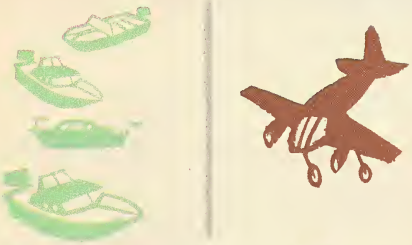


■ is greater than ●.

■ is greater than ●.

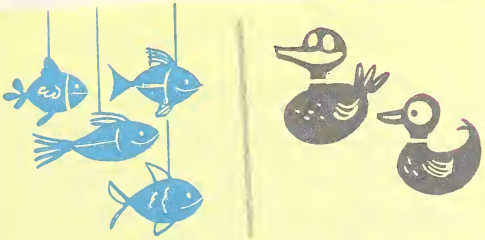
1 is less than 2.

1 is less than 3.



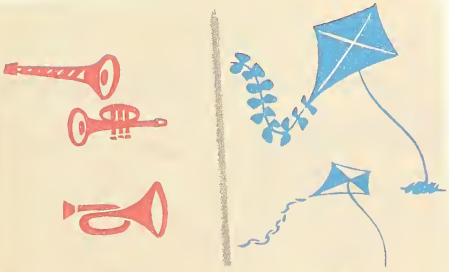
1 is less than ▬.

▬ is less than 3.



▬ is less than ●.

▬ is less than ●.



▬ is less than ●.

▬ is less than ●.

is less than is greater than

4 1 3 2

■ is greater than ●.

■ is less than ●.

1 ____ 4.

4 ____ 1.

3 ____ 2.

2 ____ 3.

■ is greater than ●.

■ is less than ●.

■ is less than ●.

■ is greater than ●.

3 ____ 4.

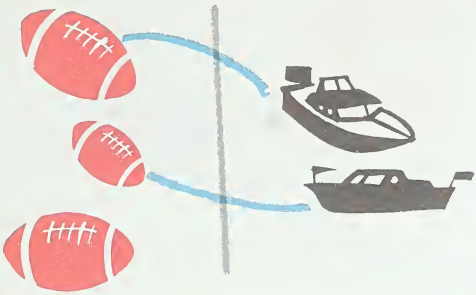
4 ____ 3.

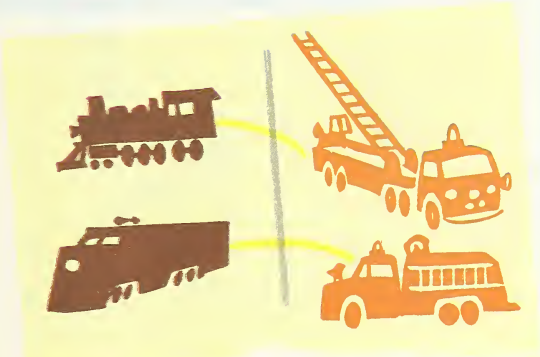
2 ____ 1.

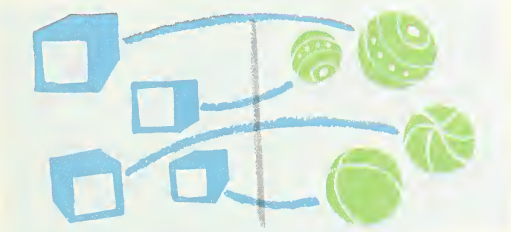
1 ____ 2.

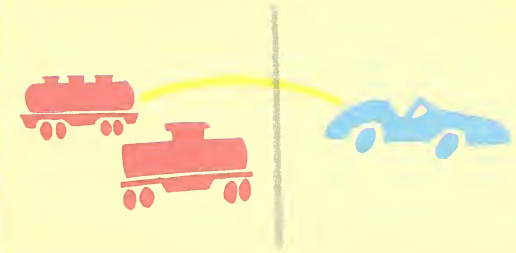
4 ____ 2.

2 ____ 4.



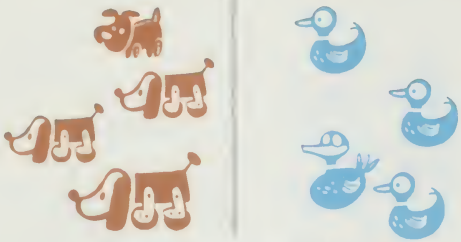




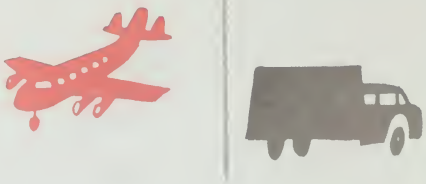


CARDINAL IDEA OF NUMBER

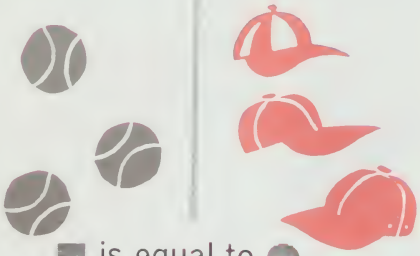
Idea of "equal to"; oral use of the words "is equal to"



4 is equal to 4.



1 is equal to ■.

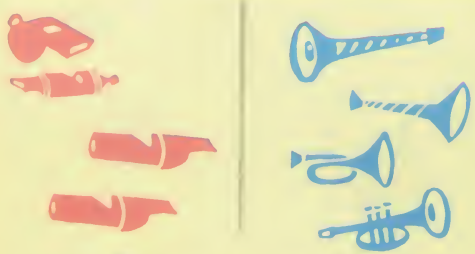


■ is equal to ●.

■ is equal to ●.

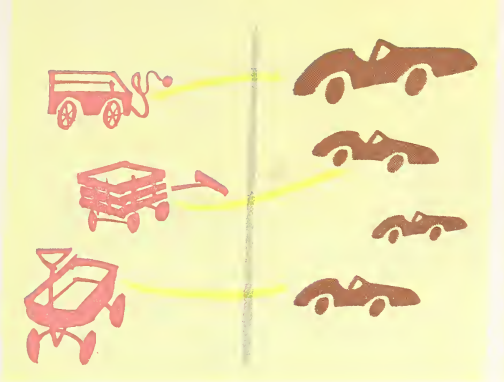
■ is less than ●.

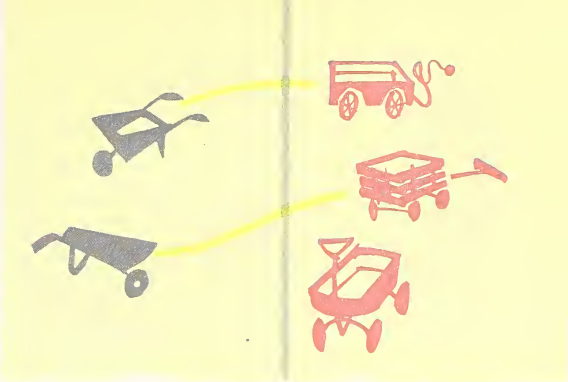
■ is equal to ●.

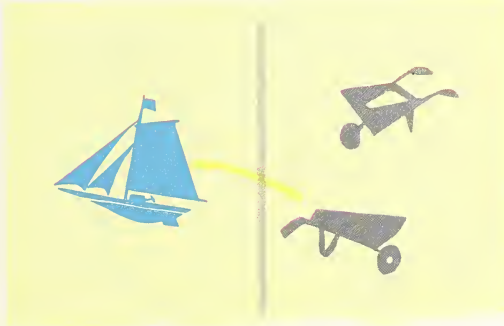


■ is equal to ●.

■ is greater than ●.





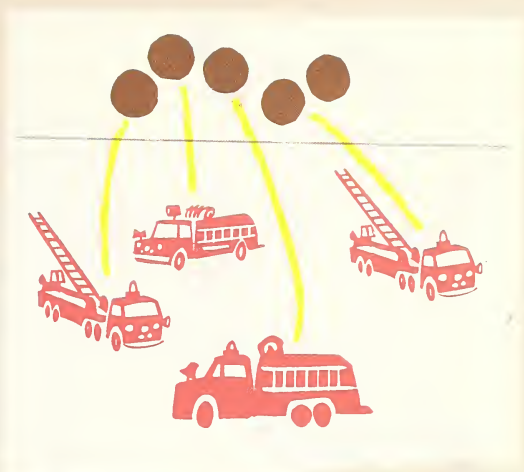


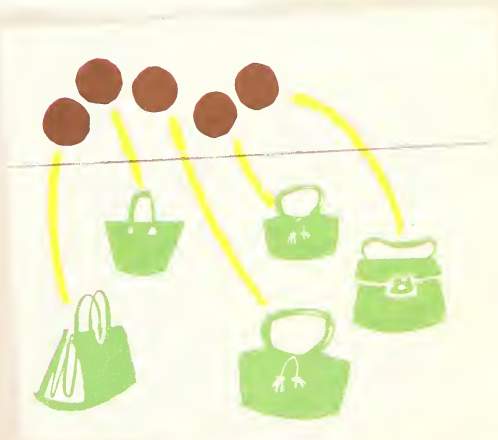
CARDINAL IDEA OF NUMBER

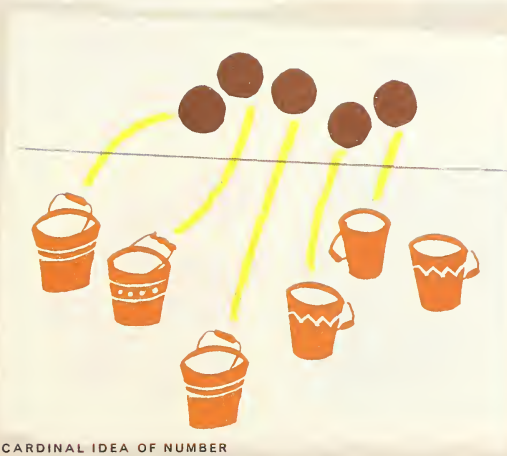
Idea of "one less than"; introduction of the number 0; oral use of the word "zero"

CARDINAL IDEA OF NUMBER

Idea of "one greater than"; introduction of the number 5, oral use of the word "five"

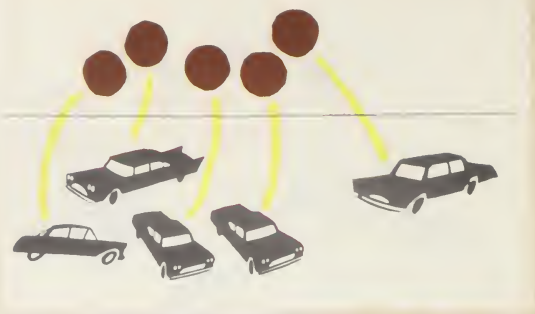


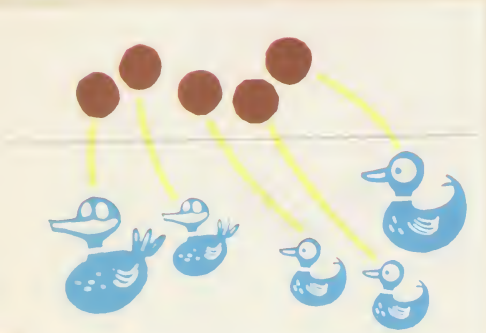


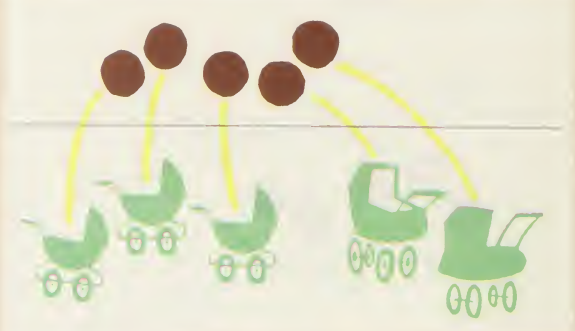


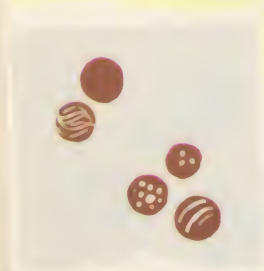
CARDINAL IDEA OF NUMBER

The number 5—determining equivalence; matching; oral use of the word "five"



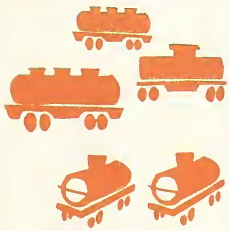






three one zero five 5 4 2 0

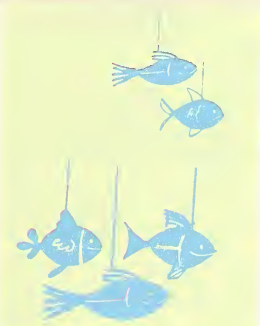
five
5



5

zero
0

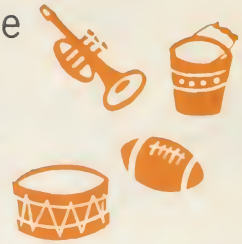
0



- zero
- five
- four
- two

4 ● 0 ● 2 ● 5 ●

- three
- five
- four
- one



5 ● 4 ● 1 ● 3 ●

- three
- zero
- two
- four

3 ● 0 ● 4 ● 2 ●

- two
- one
- zero
- three

1 ● 3 ● 2 ● 0 ●

- two
- one
- four
- five

5 ● 4 ● 2 ● 1 ●

- one
- four
- zero
- three

3 ● 0 ● 4 ● 1 ●

- zero
- five
- three
- four

5 ● 0 ● 4 ● 3 ●

- one
- three
- five
- two

2 ● 1 ● 5 ● 3 ●

■ is less than ●.

■ is greater than ●.

5 ⟋⟋⟋ ■.

■ ⟋⟋⟋ 5.

■ ⟋⟋⟋ 2.

2 ⟋⟋⟋ ■.

■ is less than ●.

■ is greater than ●.

■ is equal to ●.

■ ⟋⟋⟋ 4.

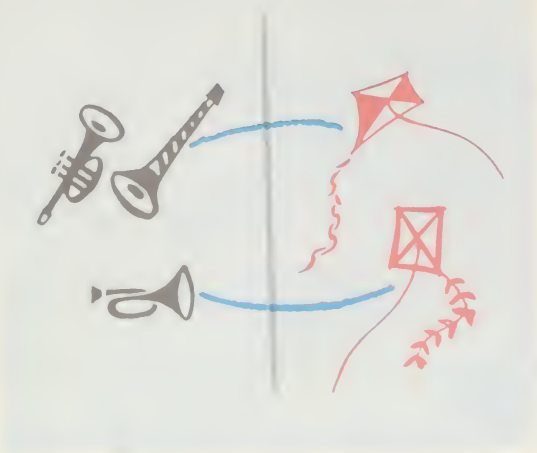
4 ⟋⟋⟋ ■.

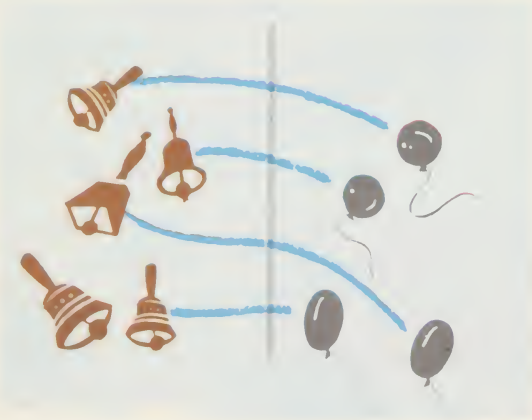
■ is greater than ●.

■ is less than ●.

■ is greater than ●.

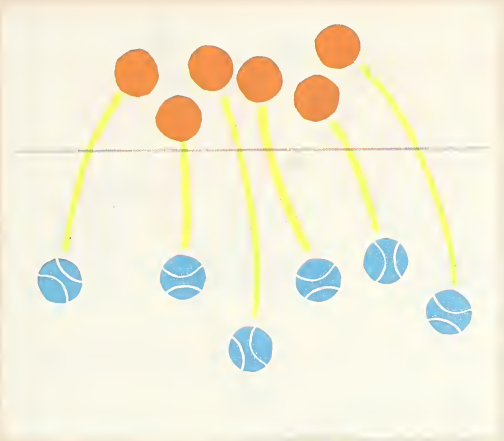
■ is less than ●.

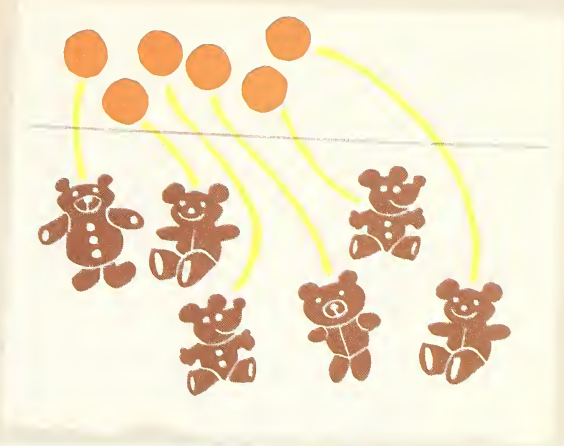


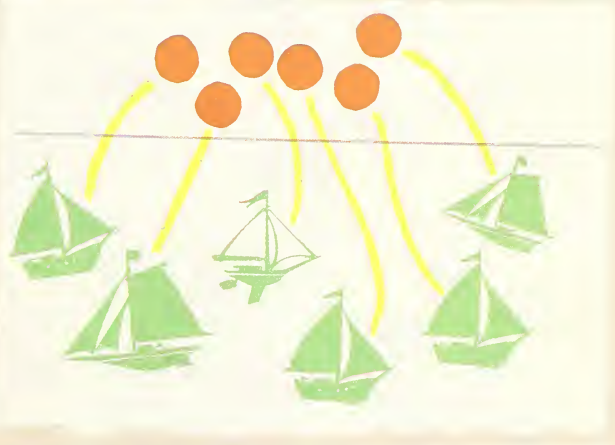


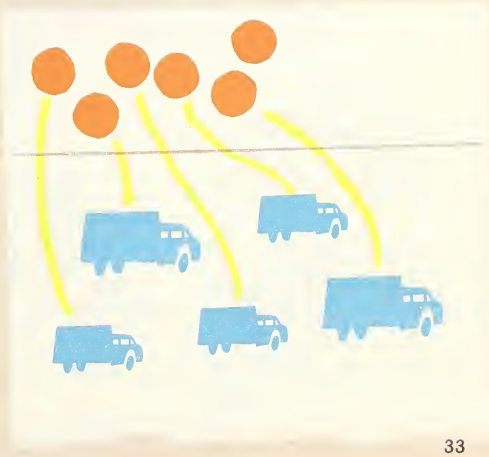
CARDINAL IDEA OF NUMBER

Introduction of the number 6; oral use of the word "six"



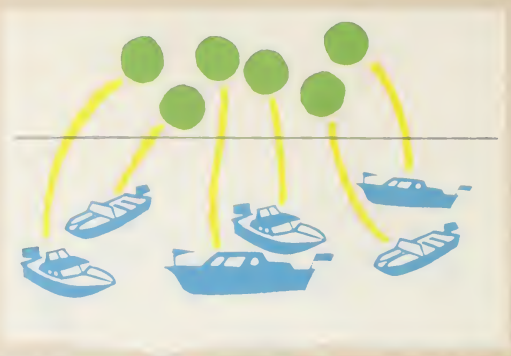


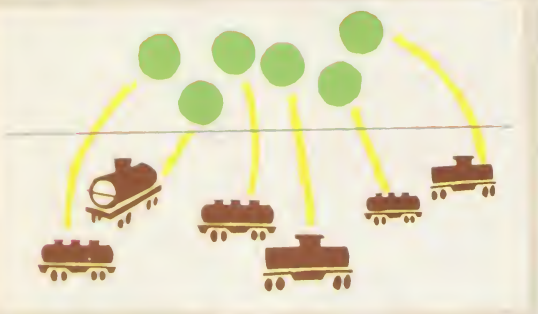


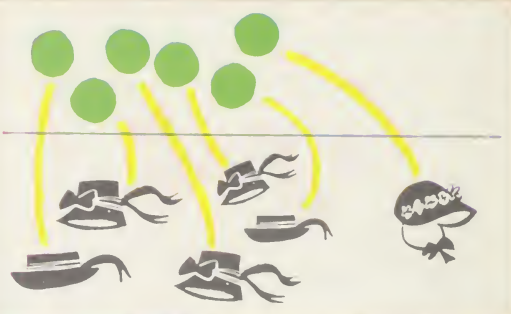


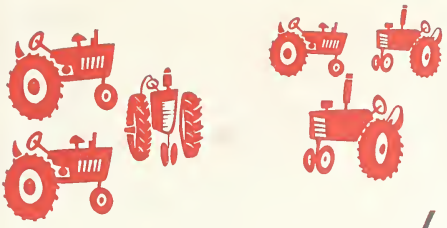
CARDINAL IDEA OF NUMBER

The number 6—determining equivalence; matching; oral use of the word "six"





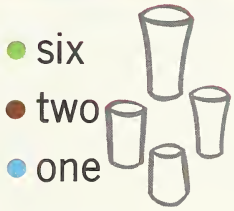




six 6

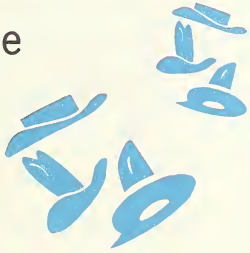
6

- zero 3
- six 1
- three 6
- one 0



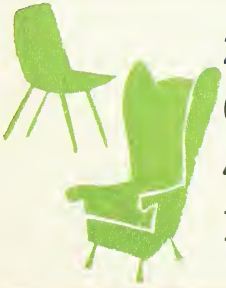
- six 0
- two 1
- one 6
- zero 2

- five 4
- four 2
- two 6
- six 5



- three 1
- five 6
- six 3
- one 5

- five 0
- zero 3
- three 4
- four 5



- two 2
- one 6
- six 4
- four 1

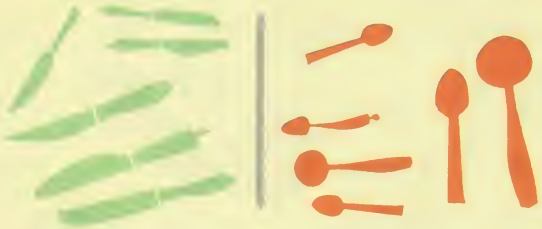
- six 3
- four 5
- five 6
- three 4

■ is greater than ●.

■ is less than ●.

2 ~~~~ ■.

■ ~~~~ 2.



6 ~~~~ ■.

■ is greater than ●.

■ is less than ●.

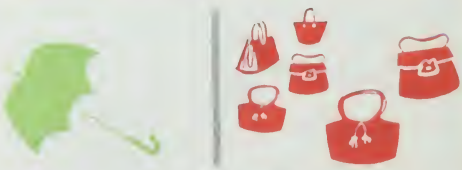
5 ~~~~ ■.

■ ~~~~ 5.

■ is less than ●.

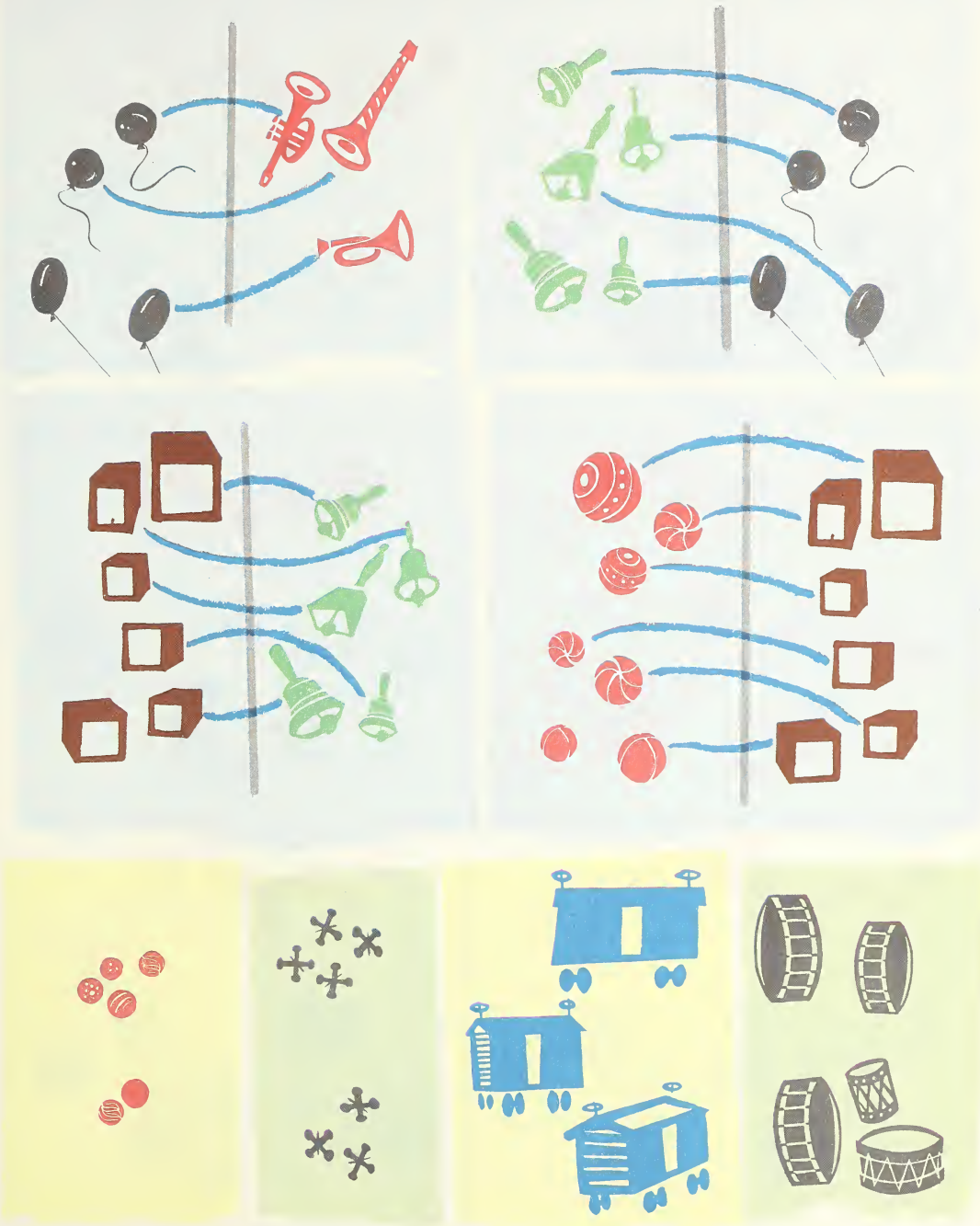
■ is greater than ●.

■ ~~~~ 4.

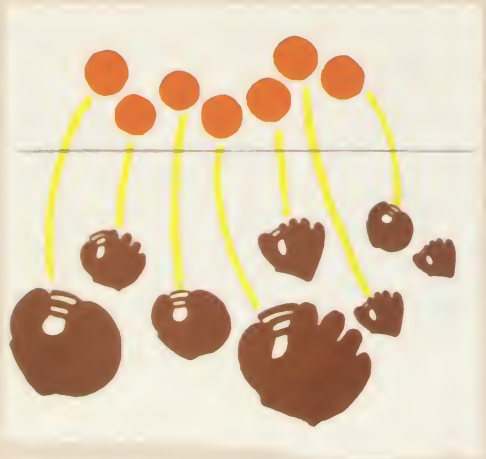


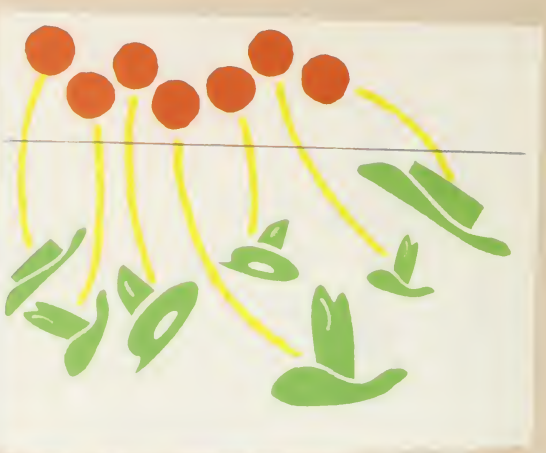
1 ~~~~ ■.

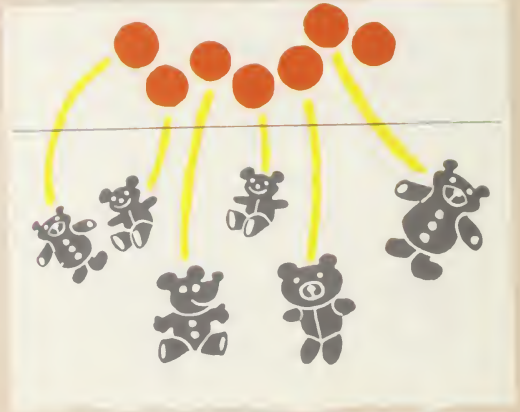
■ ~~~~ 1.

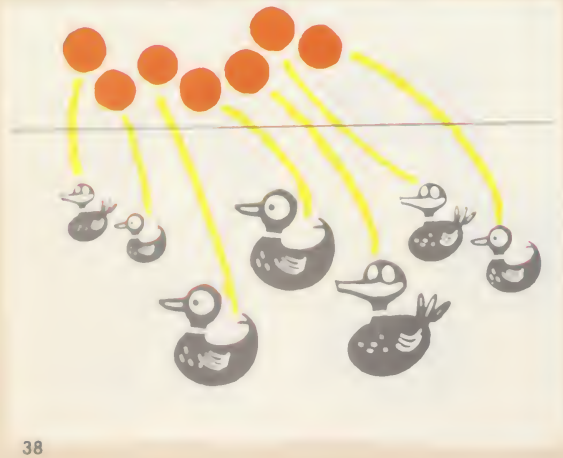


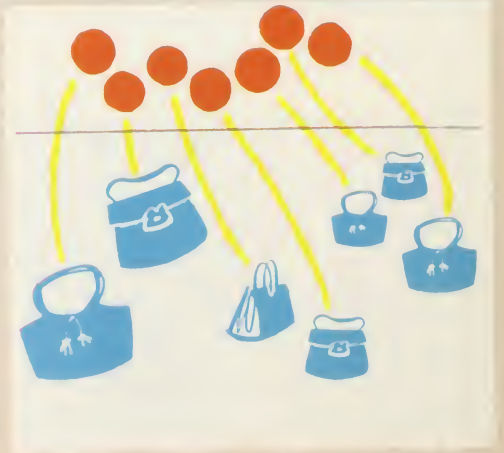
CARDINAL IDEA OF NUMBER
Introduction of the number 7; oral use of the word "seven"

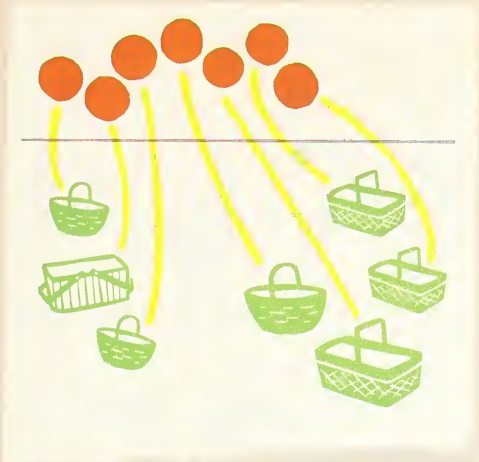


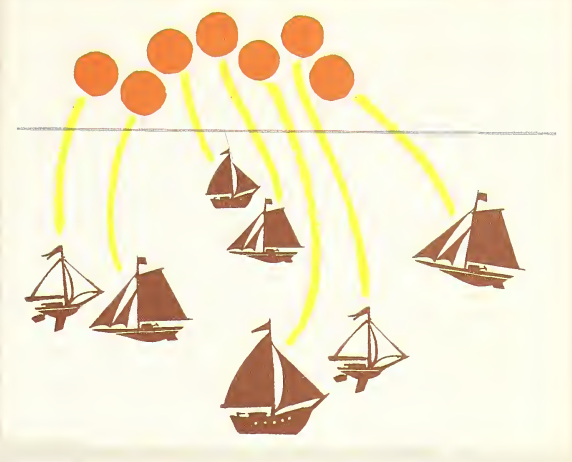


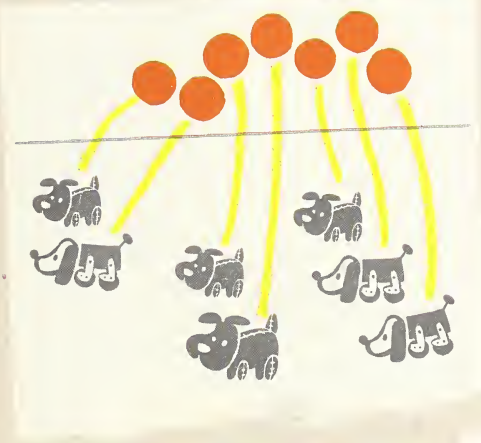


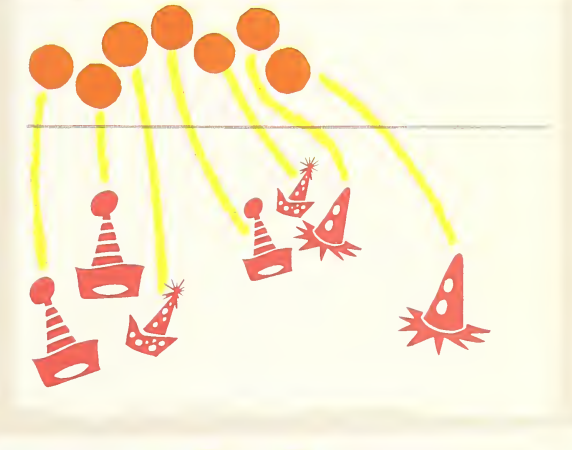


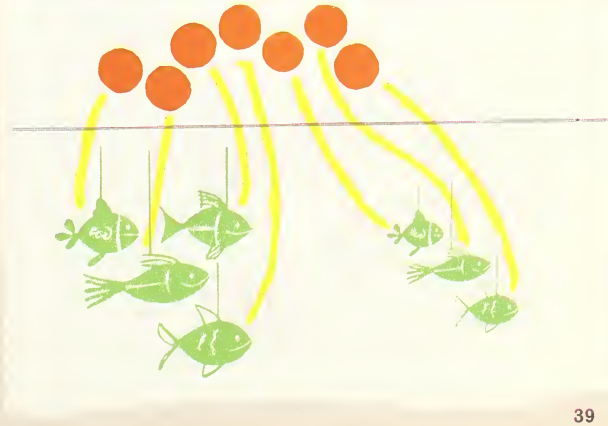












CARDINAL IDEA OF NUMBER

The number 7—grouping and regrouping; oral use of the word "seven"

seven 7

7

- three
- six
- seven
- one

6
1
3
7

- six
- two
- four
- one

2
4
1
6

- three
- seven
- two
- one

3
1
7
2

- zero
- five
- three
- seven

7
3
0
5

- six
- four
- five
- two

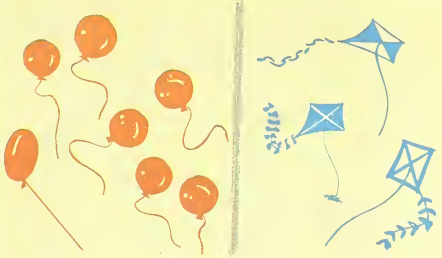
4
5
2
6

- zero
- three
- seven
- five

0
7
5
3

- seven
- four
- six
- five

5
6
4
7

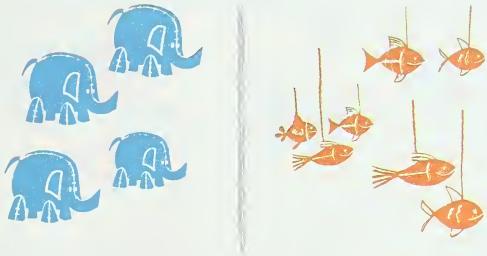


■ ⋯⋯ 3.

3 ⋯⋯ ■.

■ is less than ●.

■ is greater than ●.



4 ⋯⋯ ■.

■ ⋯⋯ 4.

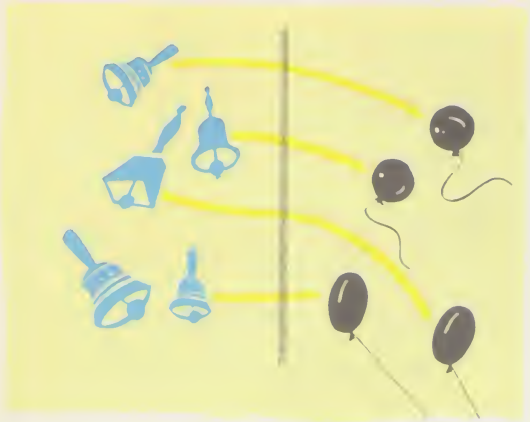
7 ⋯⋯ ■.

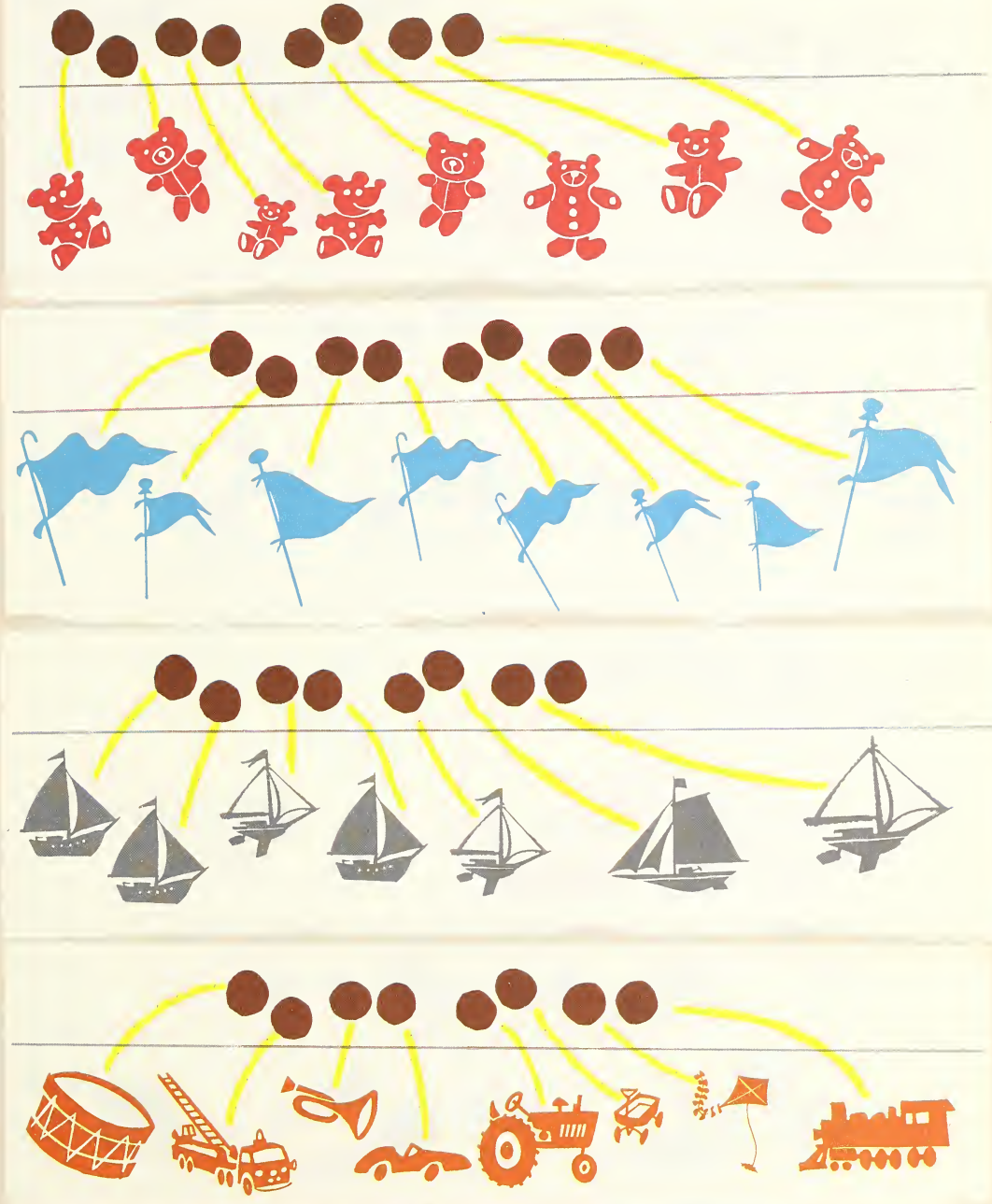
■ ⋯⋯ 7.

■ is equal to ●.

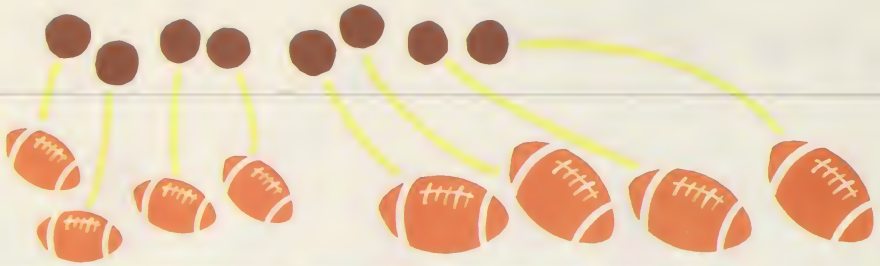
■ is greater than ●.

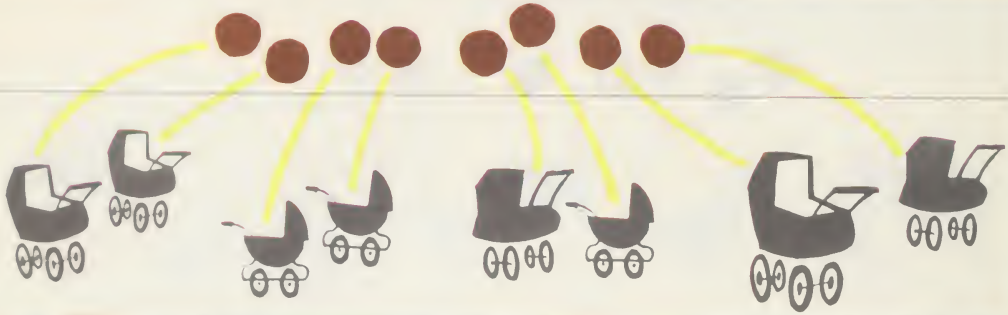
■ is less than ●.

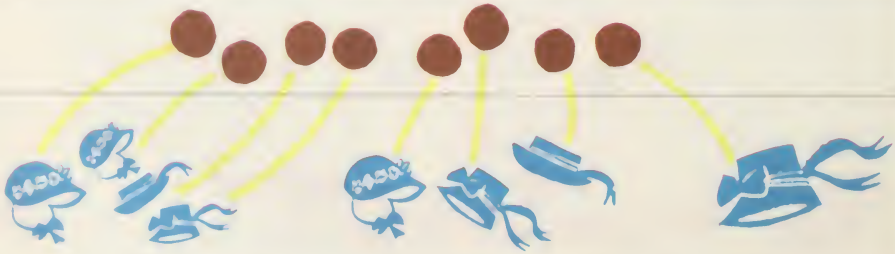




CARDINAL IDEA OF NUMBER
The number 8—determining equivalence; matching; oral use of the word "eight"







eight 8

8

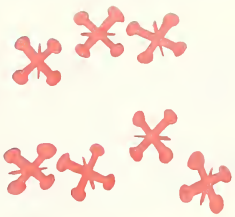
- eight
- five
- seven
- three

3
8
5
7

- three
- six
- two
- eight

6
3
8
2

- four
- seven
- zero
- five



0
5
4
7

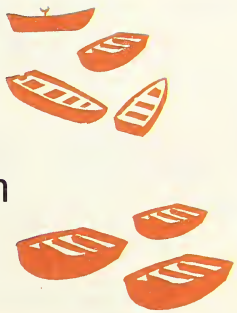
- seven
- eight
- one
- zero

8
0
1
7

- three
- six
- eight
- four

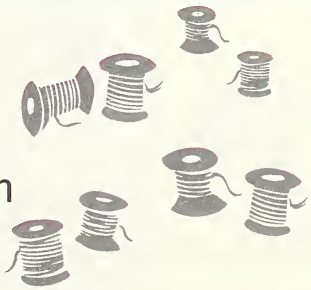
4
6
3
8

- six
- two
- seven
- one



2
7
6
1

- four
- eight
- seven
- five



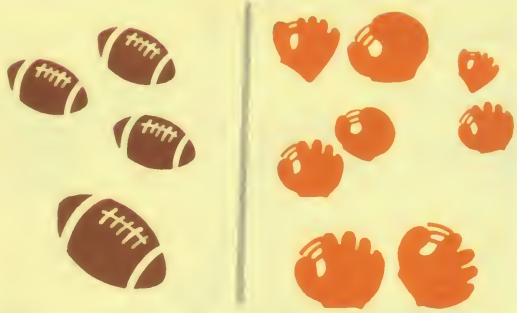
5
7
8
4

8 ~~~~ ■.

■ ~~~~ 8.

■ is less than ●.

■ is greater than ●.



4 ~~~~ ■.

■ ~~~~ 4.

■ ~~~~ 8.

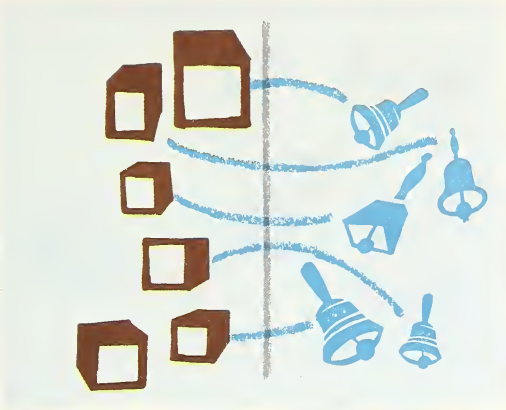
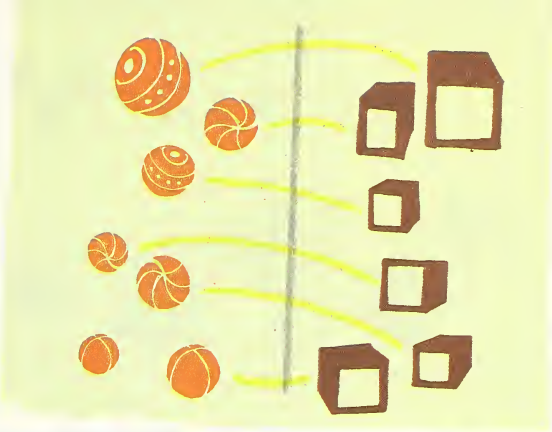
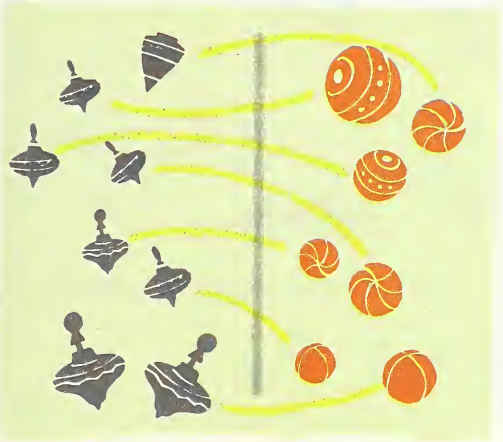
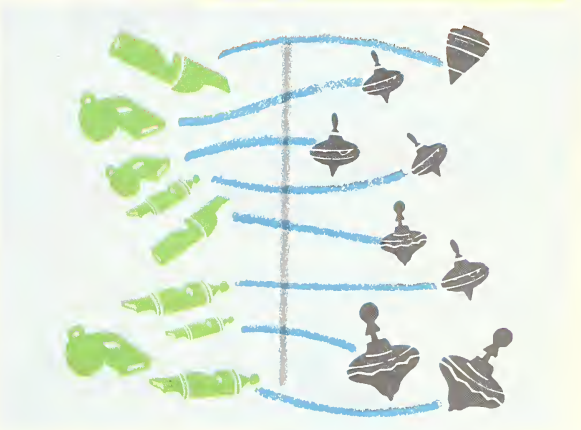
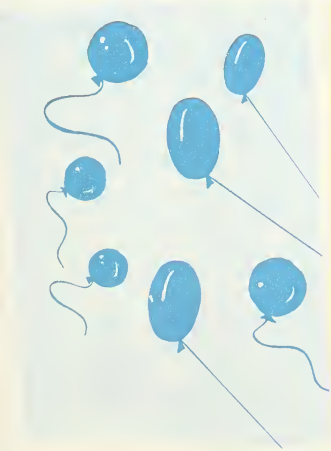
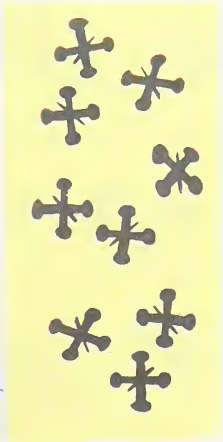
8 ~~~~ ■.

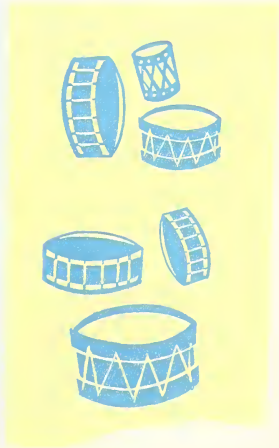
■ is greater than ●.

■ is less than ●.

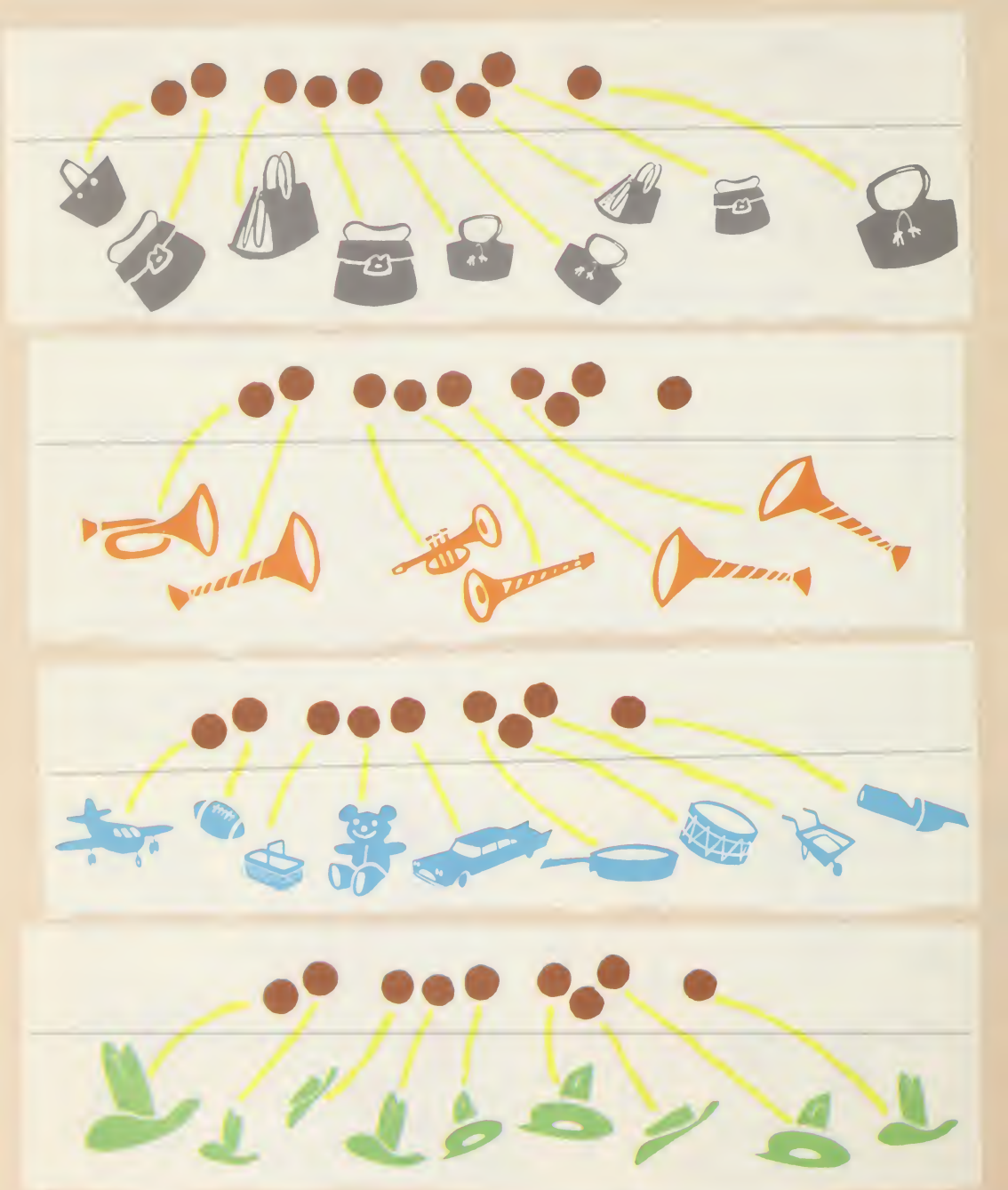
7 ~~~~ ■.

■ ~~~~ 7.

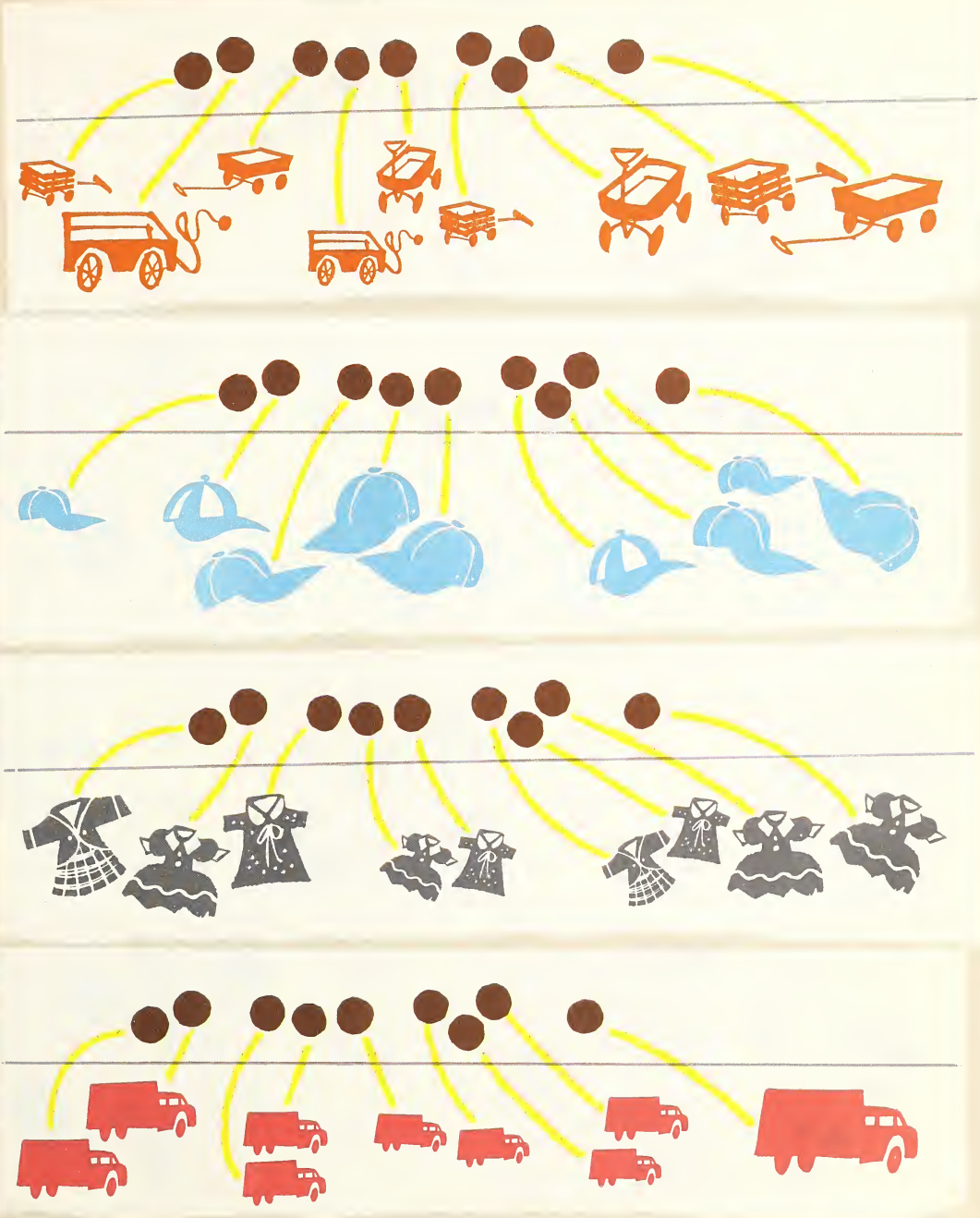


CARDINAL IDEA OF NUMBER
Introduction of the number 9; oral use of the word "nine"



CARDINAL IDEA OF NUMBER

The number 9—determining equivalence, matching; oral use of the word "nine"



CARDINAL IDEA OF NUMBER
The number 9—grouping and regrouping; oral use of the word "nine"

CARDINAL IDEA OF NUMBER

The number 9—grouping and regrouping; oral use of the word "nine"

nine 9

9

- three
- eight
- five
- nine

5 9 3 8

- nine
- eight
- three
- seven

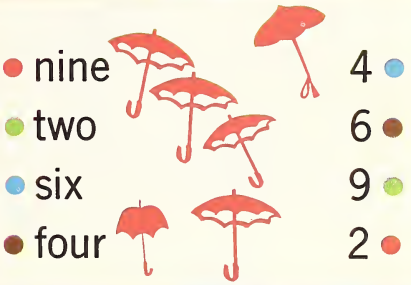
7 9 8 3

- four
- zero
- nine
- five

9 4 5 0

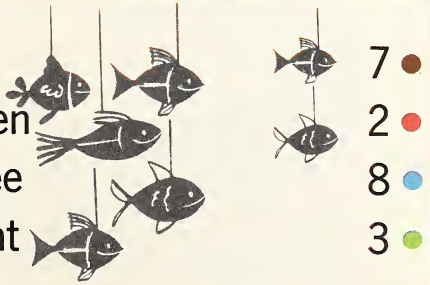
- nine
- one
- six
- zero

1 6 0 9



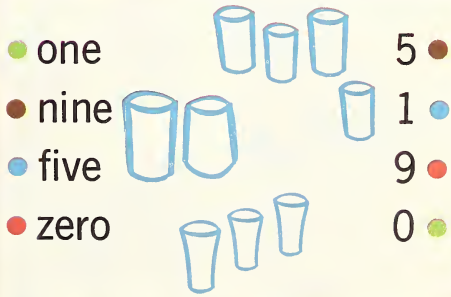
- nine
- two
- six
- four

4 6 9 2



- two
- seven
- three
- eight

7 2 8 3



- one
- nine
- five
- zero

5 1 9 0

■ is less than ●.

■ is greater than ●.

■ ~~~~ 2.

2 ~~~~ ■.

9 ~~~~ ■.

■ ~~~~ 9.

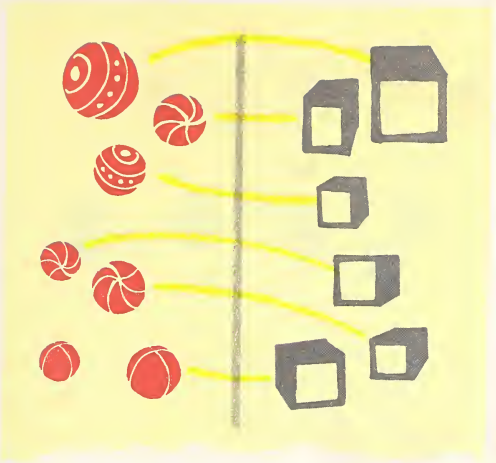
■ is greater than ●.

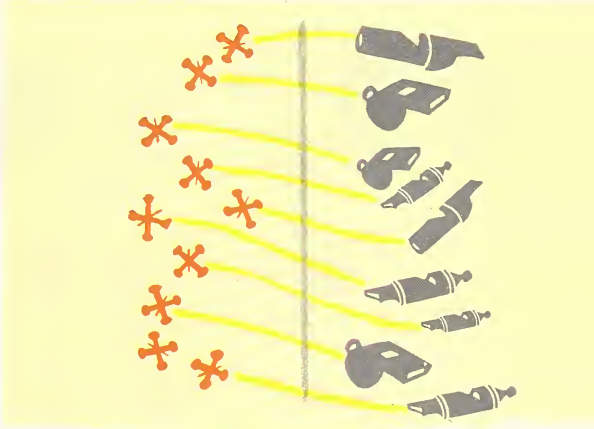
■ is less than ●.

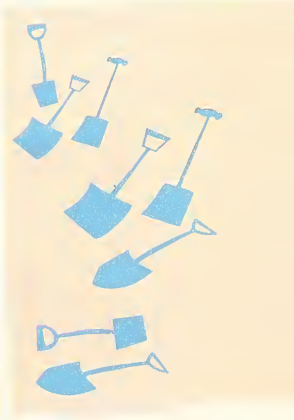
■ is equal to ●.

■ is less than ●.

■ is greater than ●.

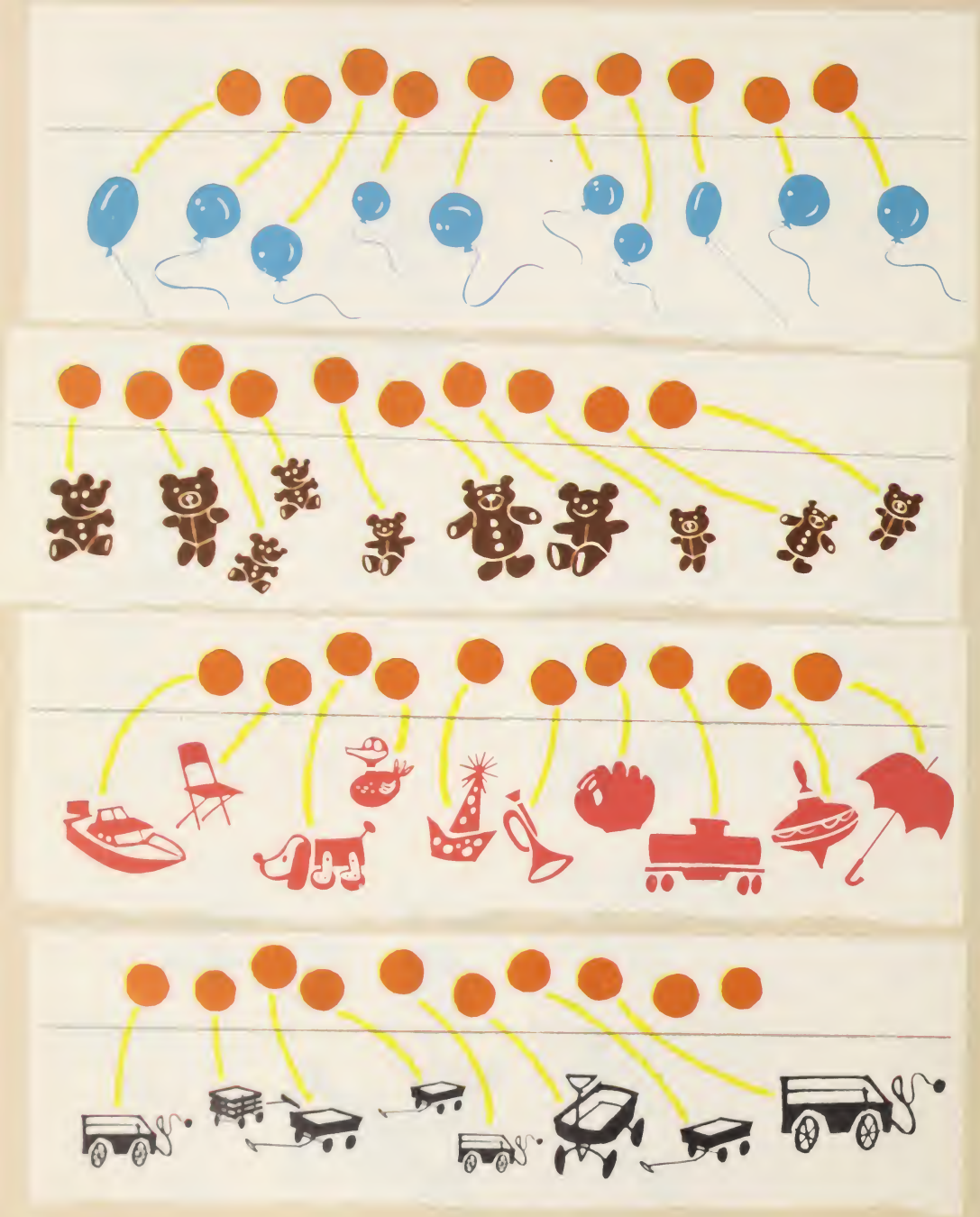


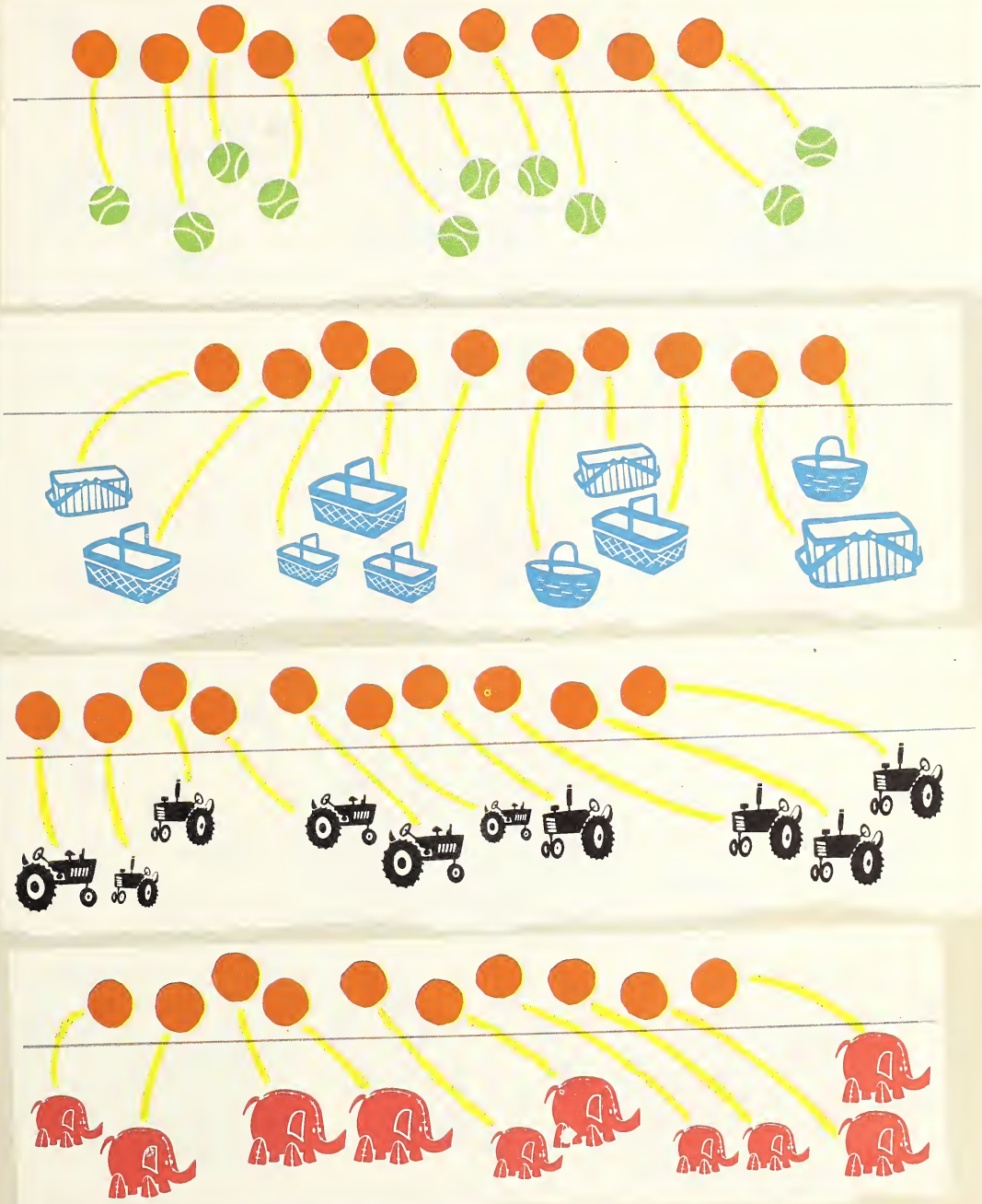




CARDINAL IDEA OF NUMBER

Introduction of the number 10; oral use of the word "ten"

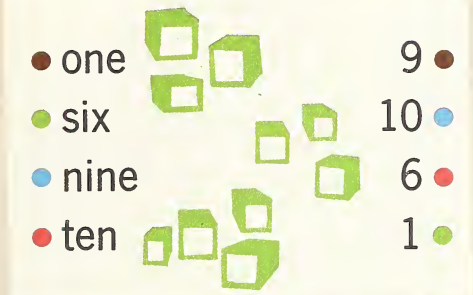




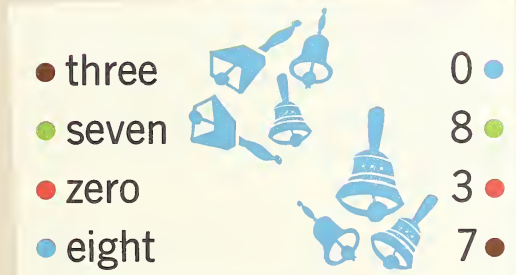
CARDINAL IDEA OF NUMBER
The number 10—grouping and regrouping; oral use of the word "ten"

ten 10
10

seven
three
eight
ten
8
7
10
3

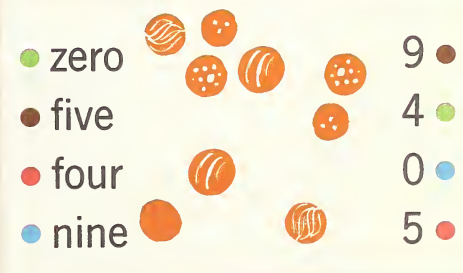

one
six
nine
ten
9
10
6
1

ten
two
five
six
6
2
10
5


three
seven
zero
eight
0
8
3
7

one
nine
ten
four
10
4
1
9

ten
two
seven
six
6
2
10
7


zero
five
four
nine
9
4
0
5

■ is greater than ●.

■ is less than ●.

■ ~~~~ 10.

10 ~~~~ ■.

6 ~~~~ ■.

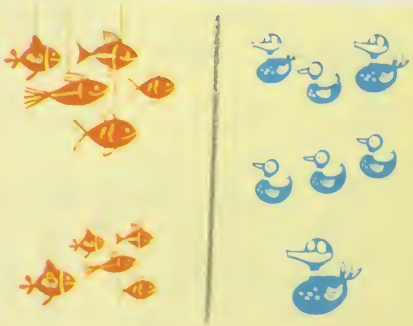
■ ~~~~ 6.

■ is less than ●.

■ is greater than ●.

■ is less than ●.

■ is greater than ●.



■ ~~~~ 10.

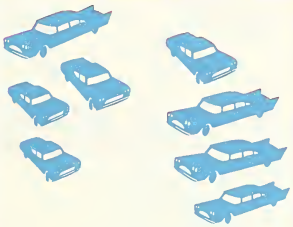
10 ~~~~ ■.

8 3 5 7 0

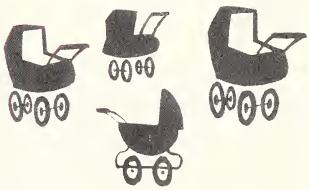
6 9 8 5 10

4 1 6 7 8

5 2 10 6 9

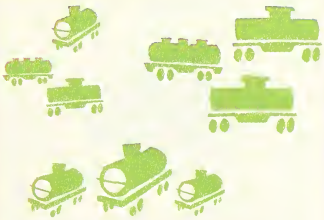


8 9 6 0 7



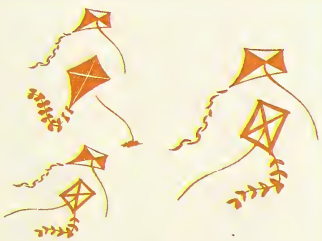
3 5 2 4 1

0 9 6 8 1



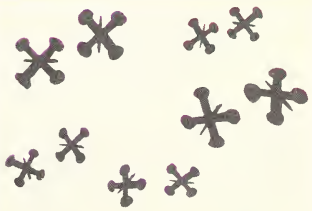
8 10 6 9 5

0 8 1 4 7



5 9 10 6 8

2 0 1 3 4



10 4 3 9 7

KEEPING SKILLFUL

Recognition of the number of objects in a set; ideas of "greater than," "less than," and "equal to"

one
1

two
2

three
3

four
4

five
5

six
6

Three is one greater than two.
Five is one greater than ▪.
Ten is one greater than ▪.
Two is one greater than ▪.

Six is one less than seven.
Eight is one less than ▪.
Nine is one less than ▪.
One is one less than ▪.

Two is one less than ▪.
Four is one greater than ▪.
Eight is one greater than ▪.
Five is one less than ▪.

Seven is one greater than ▪.
One is one less than ▪.
Eight is one greater than ▪.
Three is one less than ▪.

Six is one greater than ▪.
Seven is one less than ▪.
Nine is one greater than ▪.
Three is one less than ▪.

Two is one greater than ▪.
Ten is one greater than ▪.
Six is one less than ▪.
Four is one less than ▪.

seven
7

eight
8

nine
9

ten
10

6 is between 5 and 7.
▪ is between 2 and 4.
▪ is between eight and ten.
▪ is between 3 and 5.

2 is between 1 and ▪.
7 is between 6 and ▪.
Five is between ▪ and six.
8 is between ▪ and 9.

▪ is between six and eight.
▪ is between one and three.
9 is between 8 and ▪.
4 is between ▪ and 5.

3 is between ▪ and 4.
▪ is between 7 and 9.
▪ is between four and six.
Seven is between ▪ and eight.

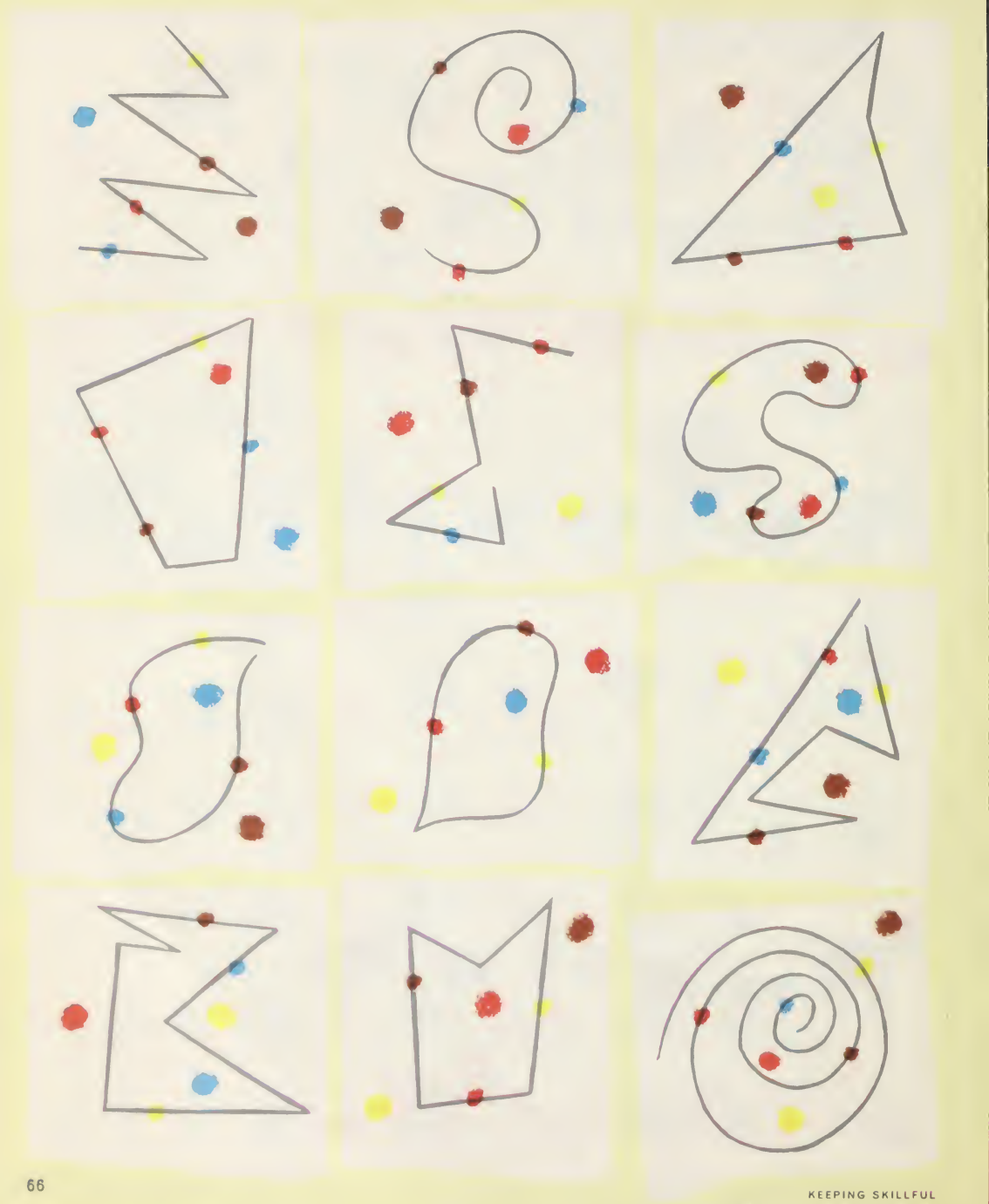
▪ is between 5 and 7.
Nine is between ▪ and ten.
Four is between three and ▪.
3 is between 2 and ▪.

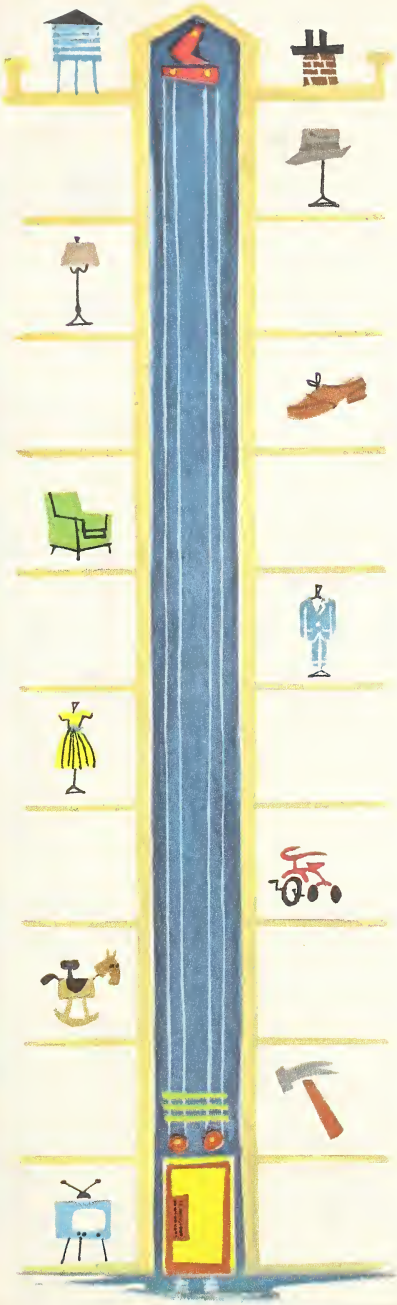
6 is between ▪ and 7.
▪ is between 8 and 10.
Five is between four and ▪.
Two is between ▪ and three.

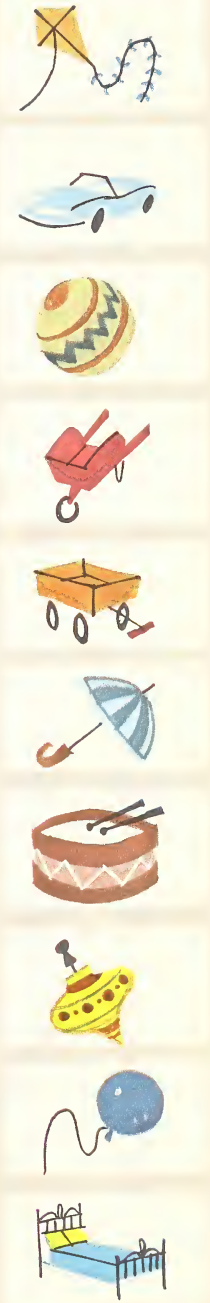
1
2
3
4
5
6
7
8
9
10

1 2 3 4 5 6 7 8 9 10

CARDINAL IDEA OF NUMBER
Ordering the counting numbers from 1 through 10; counting by ones through 10

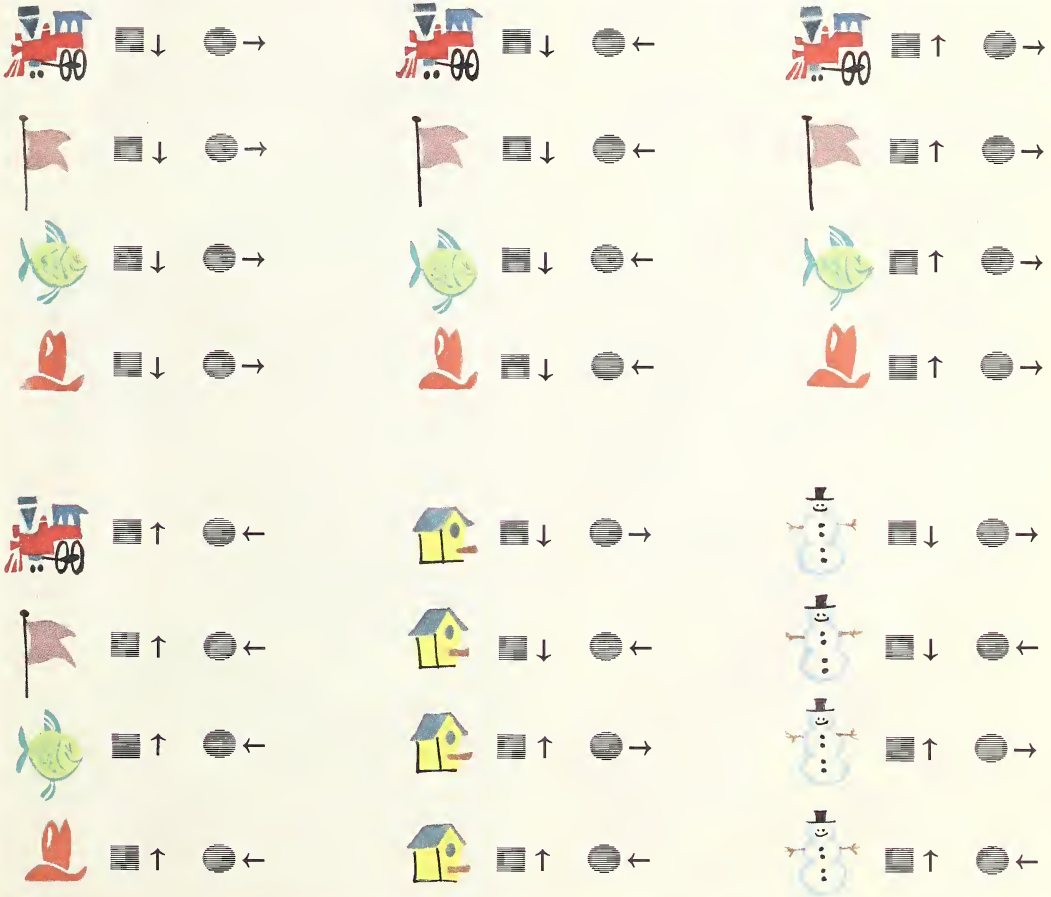


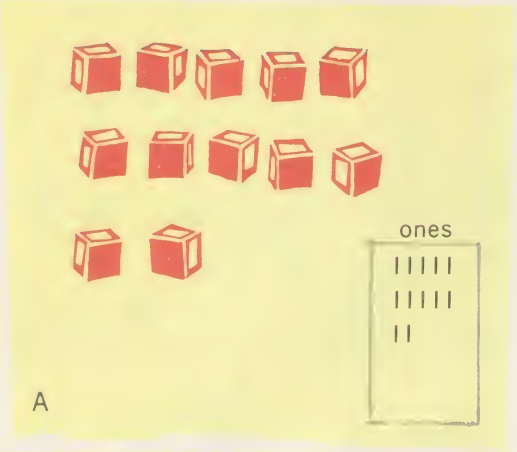


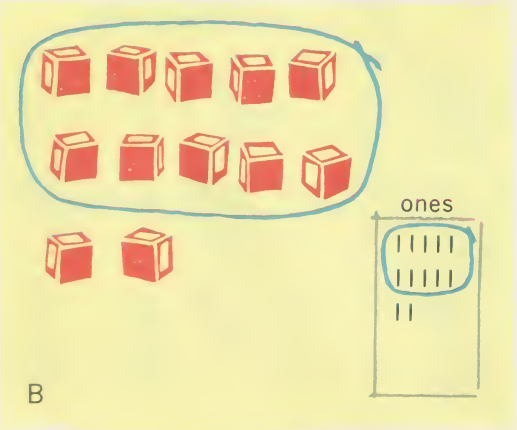


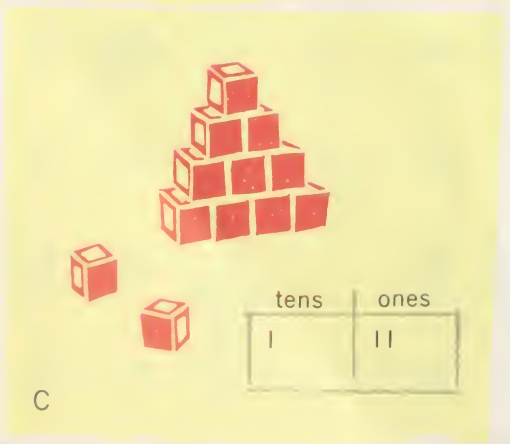
ORDINAL USE OF THE COUNTING NUMBERS
Position within a set; oral use of the ordinal words

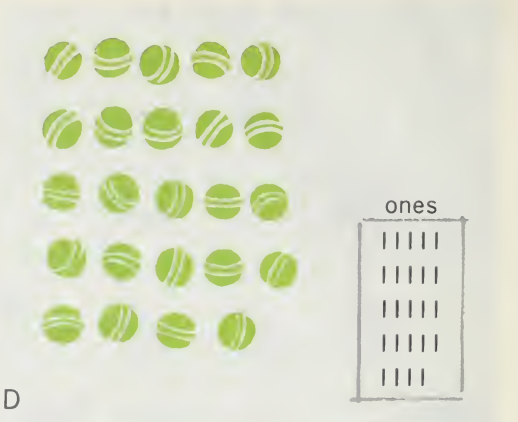
6↓	7→	3↓	4←	8↑	2→	9↑	6←	7↑	7←
10↓	5→	8↓	9←	3↑	5→	2↑	10←	1↓	3←
2↓	10→	10↓	10←	5↑	10→	4↑	3←	4↓	2→
4↓	4→	6↓	4←	7↑	8→	6↑	2←	5↑	1→
7↓	6→	9↓	5←	6↑	1→	1↑	8←	8↓	7←
5↓	8→	1↓	1←	2↑	4→	10↑	5←	10↑	8→

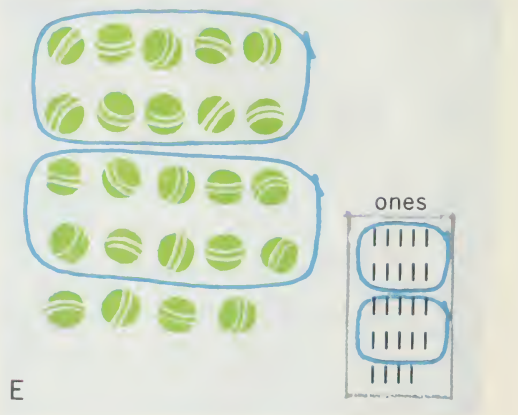



ones
A

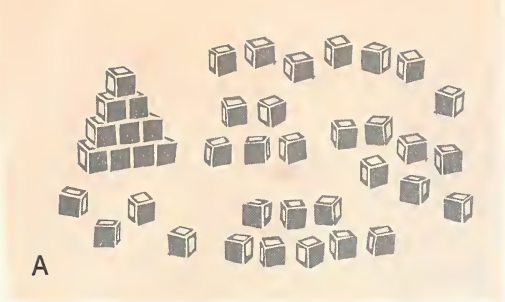

ones
B


tens
ones
C


ones
D


ones
E

tens
ones
F



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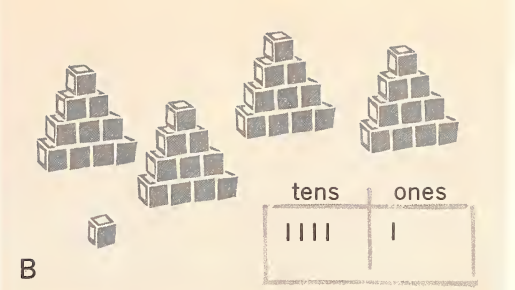

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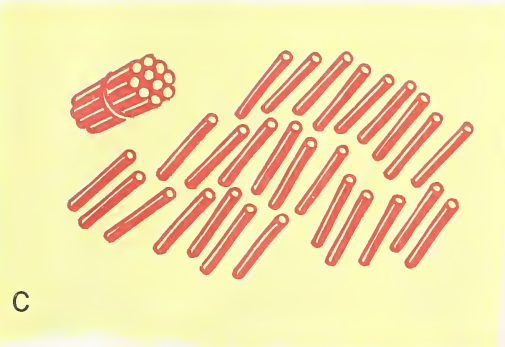
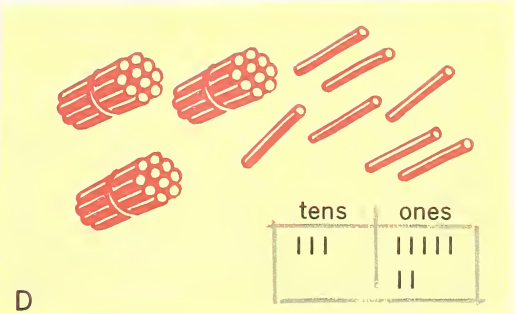


C



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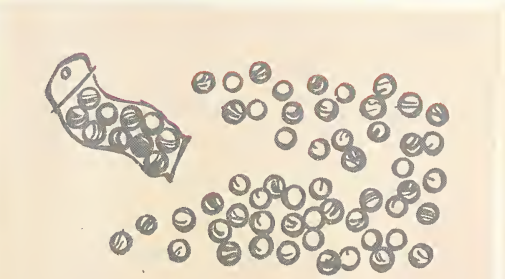

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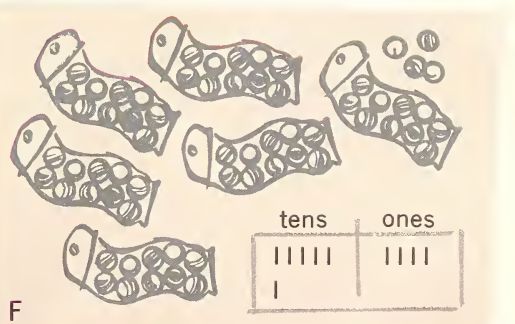

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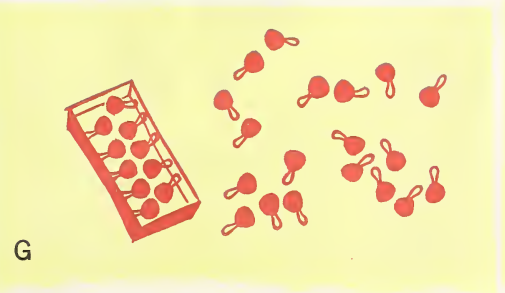

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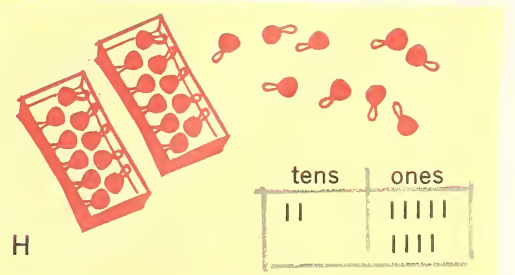

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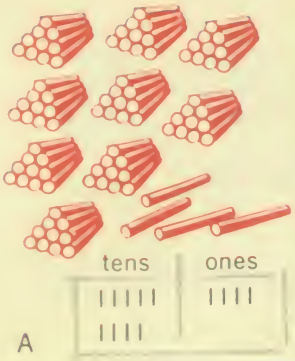
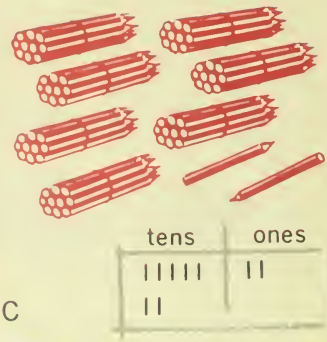

tens
ones

A

tens
ones

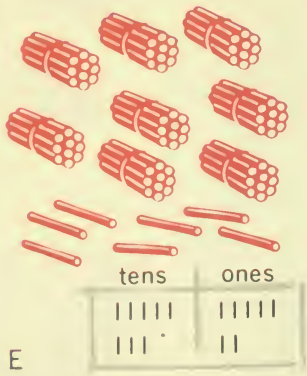
B


tens
ones

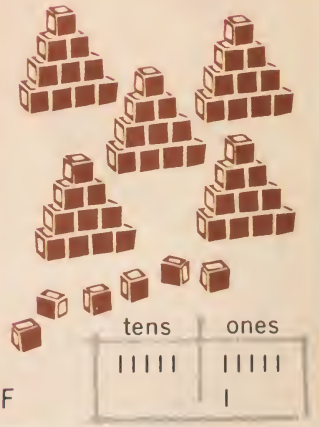
C

tens
ones

D


tens
ones

E


tens
ones

F

tens
ones

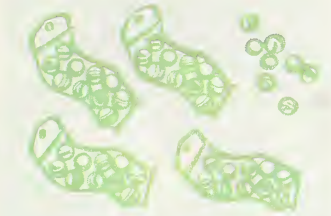
G

tens
ones

H

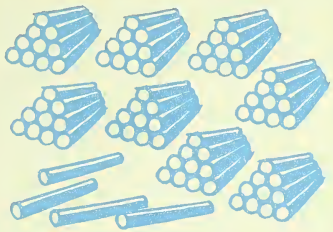
tens
ones

I



A

tens	ones
4	8

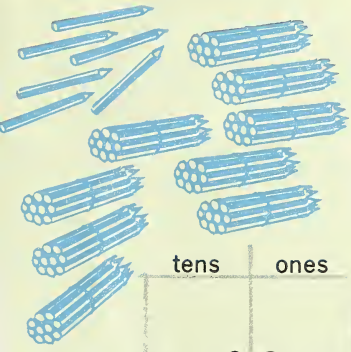


B

tens	ones
8	4

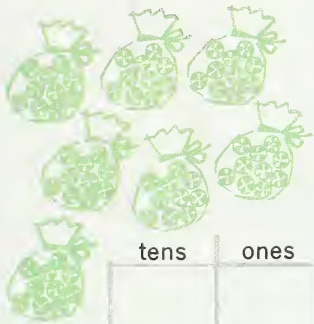
C

tens	ones
6	9



D

tens	ones
9	6



E

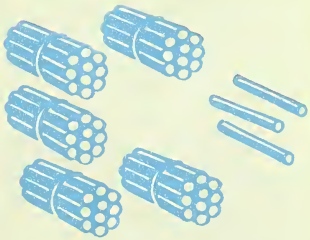
tens	ones
7	0

F

tens	ones
3	5

G

tens	ones



H

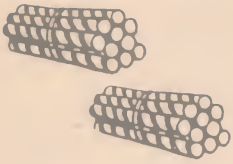
tens	ones

I

tens	ones

tens	ones
I	
1	0

A 10



tens	ones
II	
2	0

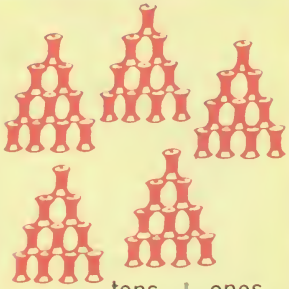
B 20

tens	ones
III	
3	0

C 30

tens	ones
4	0

D 40

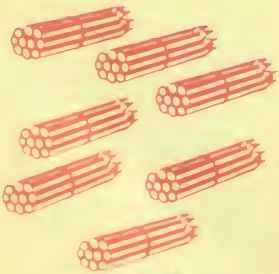


tens	ones
5	0

E 50

tens	ones
6	0

F 60



tens	ones
7	0

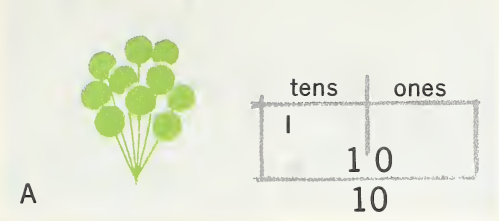
G 70

tens	ones
8	0

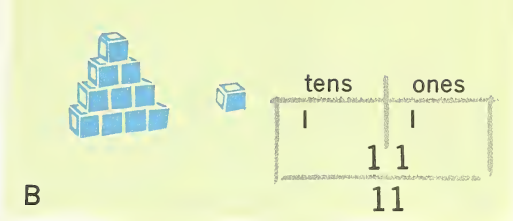
H 80

tens	ones
9	0

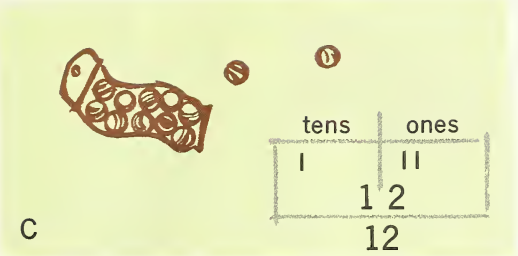
I 90


tens
ones
I
1 0
10

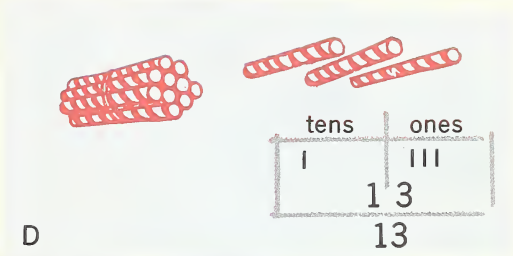
A


tens
ones
I
I
1 1
11

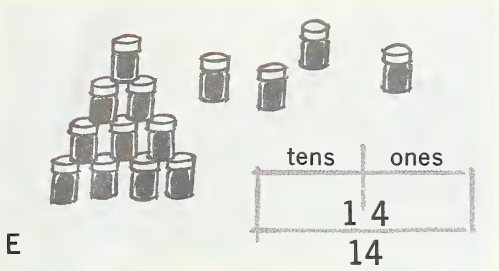
B


tens
ones
I
II
1 2
12

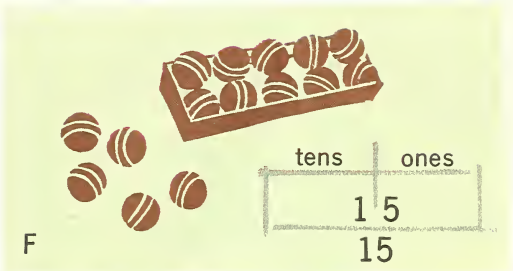
C


tens
ones
I
III
1 3
13

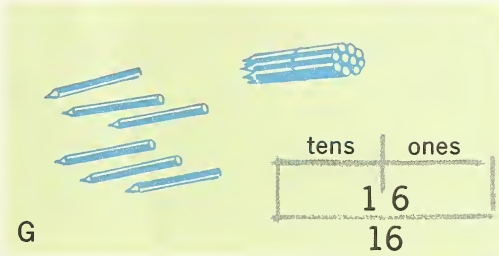
D


tens
ones
1 4
14

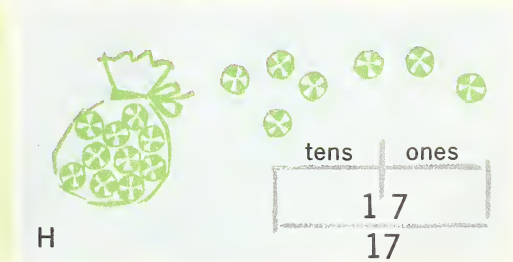
E


tens
ones
1 5
15

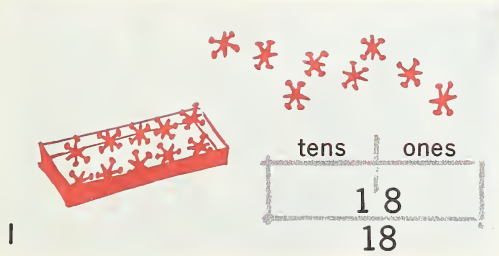
F


tens
ones
1 6
16

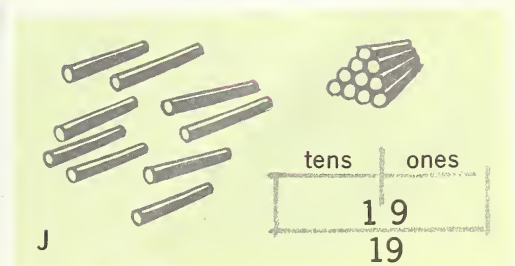
G


tens
ones
1 7
17

H


tens
ones
1 8
18

I


tens
ones
1 9
19

J

A

tens	ones
2	0

20

B

tens	ones
2	1

21

C

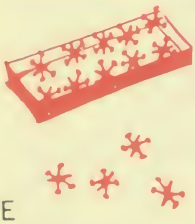
tens	ones
2	2

22

D

tens	ones
2	3

23



E

tens	ones
2	4

24

F

tens	ones
2	5

25

G

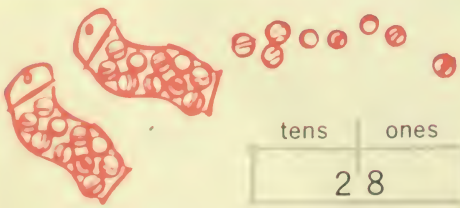
tens	ones
2	6

26

H

tens	ones
2	7

27



I

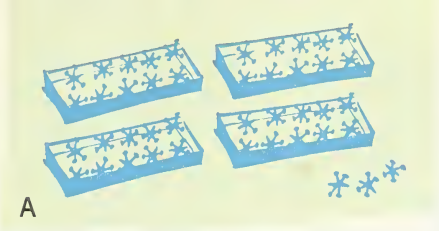
tens	ones
2	8

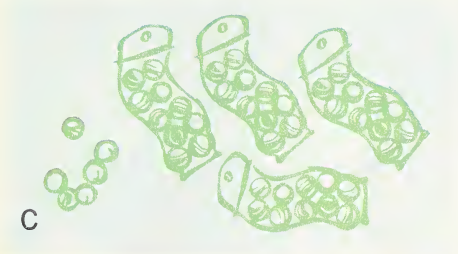
28

J

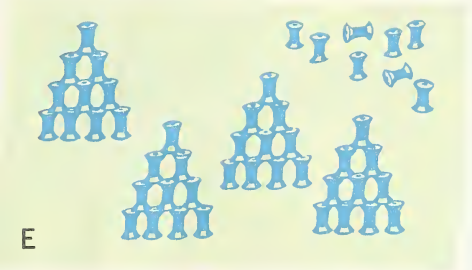
tens	ones
2	9

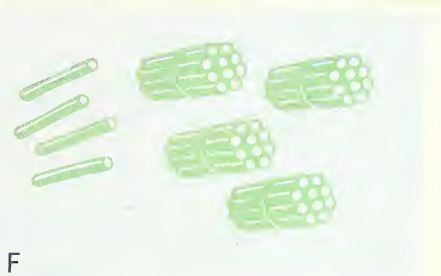
29



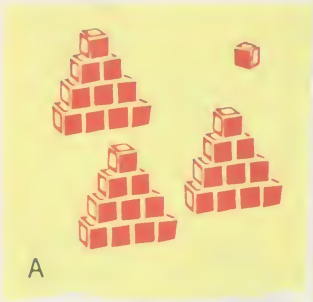


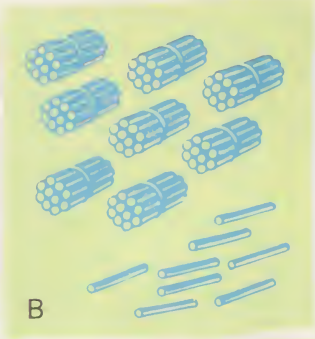
40
41
42
43
44
45
46
47
48
49



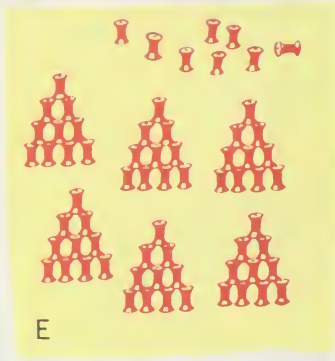


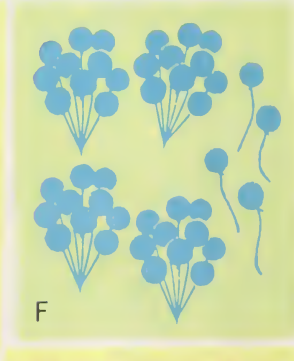
44
80
52
25



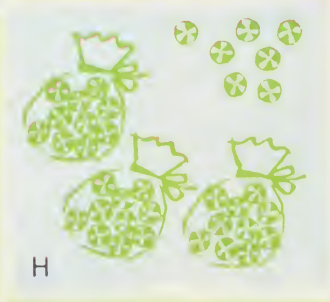


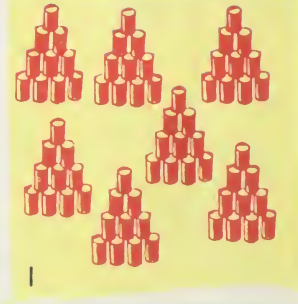
13
37
96
21



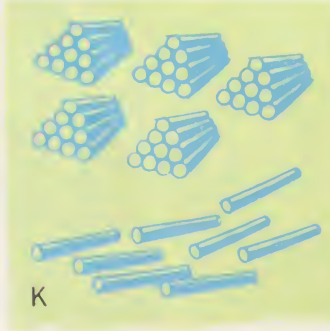


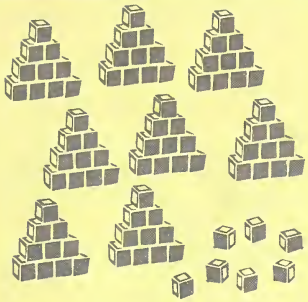
70
31
95
58





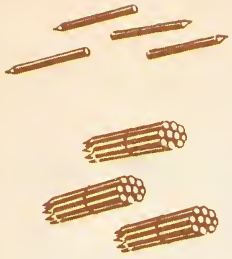
68
59
12
88





8 tens 7 ones

A 87



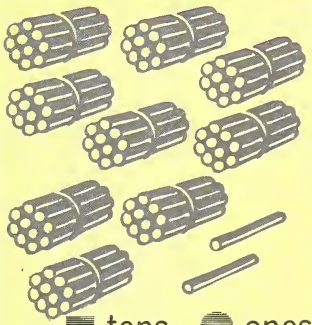
3 tens 4 ones

B

A 3 tens 6 ones 36
B 2 tens 8 ones
C 4 tens 9 ones
D 7 tens 2 ones
E 5 tens 5 ones
F 9 tens 4 ones
G 6 tens 7 ones
H 8 tens 3 ones
I 4 tens 2 ones
J 7 tens 8 ones
K 3 tens 3 ones
L 6 tens 4 ones

5 tens 3 ones

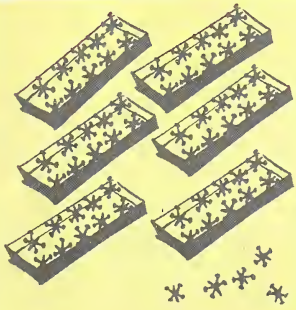
C



tens ones

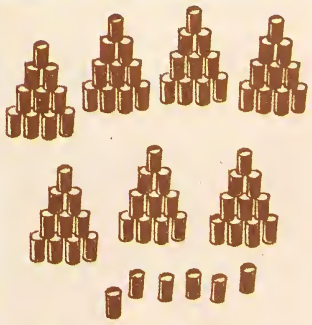
D 92

A 93 9 tens 3 ones
B 56 tens 6 ones
C 88 tens ones
D 29 tens ones
E 74 tens ones
F 38 tens ones
G 45 tens ones
H 96 tens ones
I 63 tens ones
J 47 tens ones
K 22 tens ones
L 85 tens ones



tens ones

E 65



tens ones

F

1	11	21	31	41	51	61	71	81	91
2	12	22	32	42	52	62	72	82	92
3	13	23	33	43	53	63	73	83	93
4	14	24	34	44	54	64	74	84	94
5	15	25	35	45	55	65	75	85	95
6	16	26	36	46	56	66	76	86	96
7	17	27	37	47	57	67	77	87	97
8	18	28	38	48	58	68	78	88	98
9	19	29	39	49	59	69	79	89	99
10	20	30	40	50	60	70	80	90	

A 74 is one greater than ▭.
B 30 is one greater than ▭.
C ▭ is one greater than 61.
D ▭ is one greater than 17.
E 86 is one greater than ▭.
F ▭ is one greater than 9.

G ▭ is one less than 58.
H ▭ is one less than 25.
I 53 is one less than ▭.
J 49 is one less than ▭.
K ▭ is one less than 92.
L 80 is one less than ▭.

M ▭ is between 6 and 8.
N ▭ is between 41 and 43.
O ▭ is between 22 and 24.
P ▭ is between 85 and 87.
Q ▭ is between 93 and 95.
R ▭ is between 19 and 21.

S 2 is between 1 and ▭.
T 73 is between 72 and ▭.
U 18 is between ▭ and 19.
V 65 is between ▭ and 66.
W 91 is between ▭ and 92.
X 70 is between 69 and ▭.

A 69 is one less than ▭.
B ▭ is between 45 and 47.
C 57 is one greater than ▭.
D ▭ is one greater than 95.
E 77 is between ▭ and 78.
F ▭ is one less than 50.

G 82 is between 81 and ▭.
H ▭ is between 89 and 91.
I 99 is one greater than ▭.
J ▭ is one less than 31.
K 64 is between 63 and ▭.
L 51 is between ▭ and 52.

M 5 is greater than ▭.
N 32 is greater than ▭.
O 99 is greater than ▭.
P ▭ is greater than 6.
Q ▭ is greater than 14.
R ▭ is greater than 73.

S 8 is less than ▭.
T 39 is less than ▭.
U 81 is less than ▭.
V ▭ is less than 47.
W ▭ is less than 90.
X ▭ is less than 63.

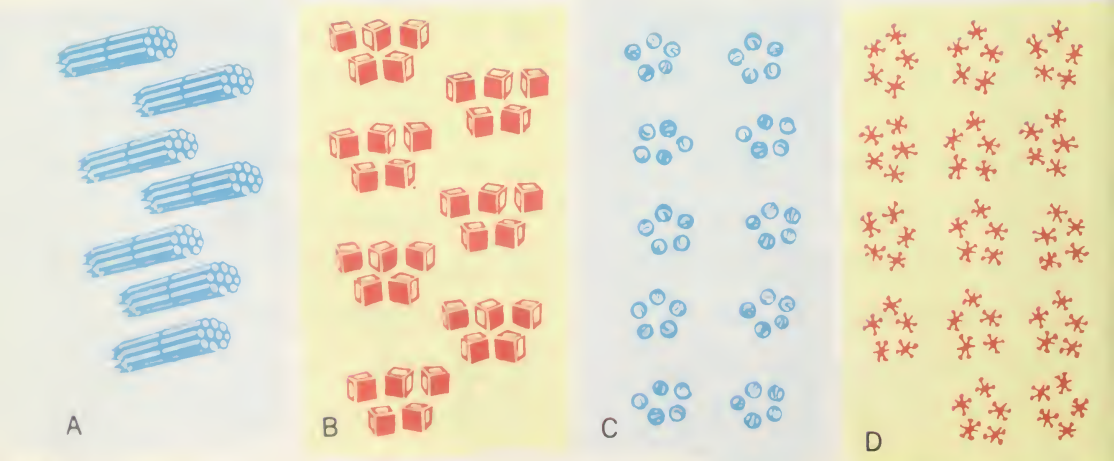
1 2 3 4 5 6 7 8 9 10 11 12 13

23 24 25 26 27 28 29 30 31 32

43 44 45 46 47 48 49 50 51

62 63 64 65 66 67 68 69 70 71

81 82 83 84 85 86 87 88 89 90



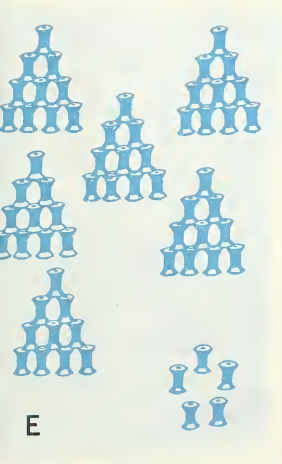
14 15 16 17 18 19 20 21 22

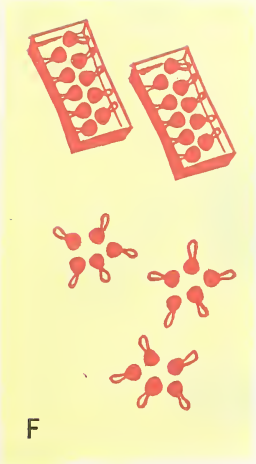
33 34 35 36 37 38 39 40 41 42

52 53 54 55 56 57 58 59 60 61

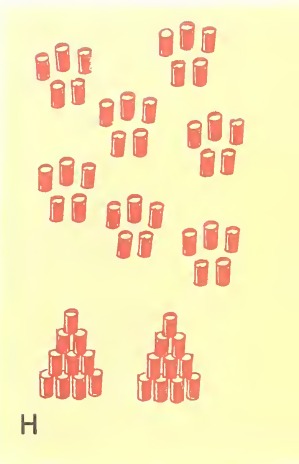
72 73 74 75 76 77 78 79 80

91 92 93 94 95 96 97 98 99


E


F

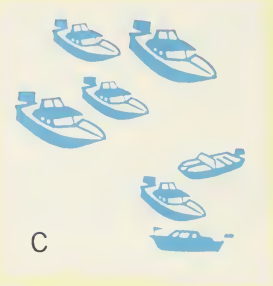
G


H

A seven
B zero
C four
D eight
E three
F five
G nine
H two
I six
J ten
K 9
L 5
M 8
N 4
O 1
P 2
Q 10
R 7
S 3
T 6

A

B


C

D

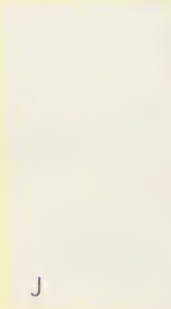
E

F

G

H

I


J

K

L

is less than	is equal to	is greater than
A 3 ____ 13.	F 40 ____ 70.	K 42 ____ 24.
B 45 ____ 45.	G 71 ____ 79.	L 8 ____ 18.
C 92 ____ 29.	H 94 ____ 94.	M 33 ____ 83.
D 66 ____ 37.	I 60 ____ 6.	N 99 ____ 91.
E 58 ____ 88.	J 10 ____ 10.	O 14 ____ 41.

is one greater than		is one less than
A 1 ____ 2.	E 29 ____ 28.	I 93 ____ 94.
B 49 ____ 50.	F 87 ____ 88.	J 21 ____ 20.
C 13 ____ 12.	G 36 ____ 35.	K 96 ____ 95.
D 75 ____ 76.	H 61 ____ 62.	L 54 ____ 55.

A ▭ is between 3 and 5.

B ▭ is between 67 and 69.

C 52 is between ▭ and 53.

D 25 is between ▭ and 26.

E 73 is between 72 and ▭.

F 96 is between 95 and ▭.

G 50 is between ▭ and 51.

H ▭ is between 16 and 18.

I 9 is between 8 and ▭.

J 87 is between 86 and ▭.

A 5 tens 6 ones ▭

B 3 tens 2 ones ▭

C 6 tens 9 ones ▭

D 9 tens 7 ones ▭

E 8 tens 4 ones ▭

F 4 tens 8 ones ▭

G 23 ▭ tens ◯ ones

H 67 ▭ tens ◯ ones

I 76 ▭ tens ◯ ones

J 34 ▭ tens ◯ ones

K 55 ▭ tens ◯ ones

L 98 ▭ tens ◯ ones

A

1

B

5

C

10

D

25

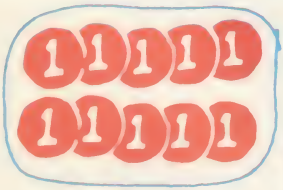
E

tens	ones
	IIIII

F

5

tens	ones
	IIIII



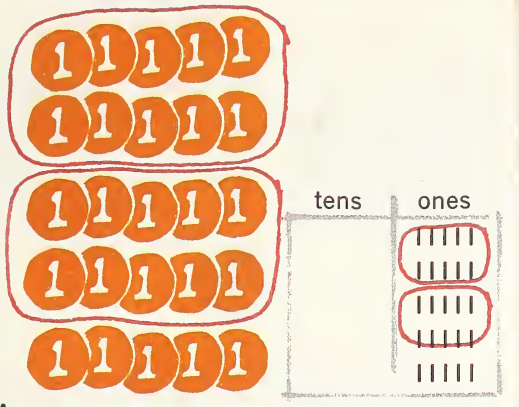
G

tens	ones
	IIIII IIIII

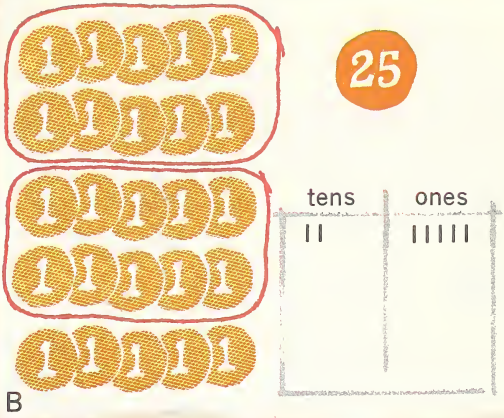
H

10

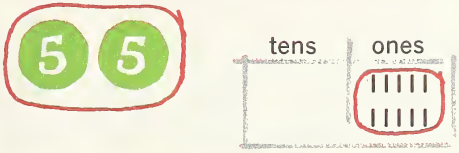
tens	ones
I	


1 1 1 1 1
1 1 1 1 1
1 1 1 1 1
1 1 1 1 1
1 1 1 1 1
tens
ones

A


1 1 1 1 1
1 1 1 1 1
1 1 1 1 1
1 1 1 1 1
1 1 1 1 1
25
tens
ones

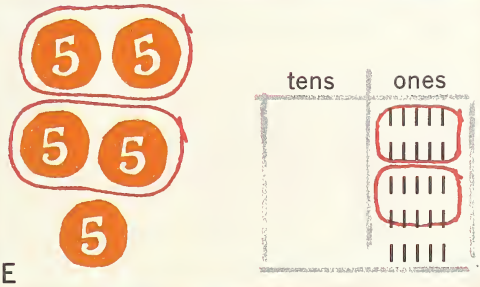
B


5 5
tens
ones

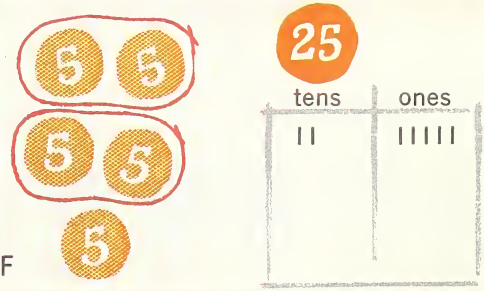
C

10
5 5
tens
ones

D


5 5
5 5
5
tens
ones

E


5 5
5 5
5
25
tens
ones

F

10
10
5
tens
ones

G

10
10
5
25
tens
ones

H

1 cent
1¢

5 cents
5¢

10 cents
10¢

25 cents
25¢

A

5 10 15 20 25 30¢

B

10 20 30 40 50 60 cents

C

5 6 7 8 9 10¢

D

10 20 21 22 23 24¢

E

25 30 35 40 45¢

F

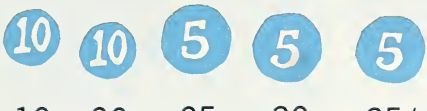
25 35 45 55 65 cents

G

10 ■ ■ ■ ■¢

H

5 ■ ■ ■ cents

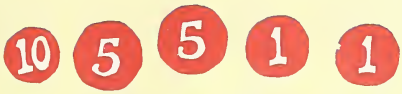


10 20 25 30 35¢

A

25 26 27 28 29 cents

B



10 ▬ ▬ ▬ ▬ ¢

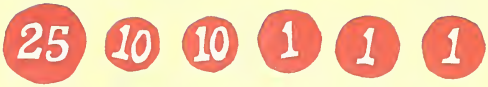
C

25 ▬ ▬ ▬ ▬ ¢

D

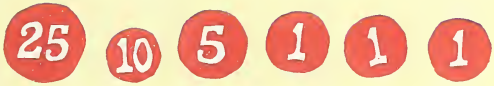
25 ▬ ▬ ▬ ▬ ¢

E



25 ▬ ▬ ▬ ▬ ▬ ¢

F



▬ cents

G

▬ ¢

H

▬ ¢

I

▬ cents

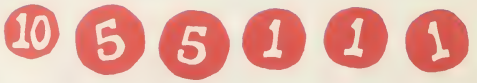
J

A

25 35 45 50 51 cents

B

C



10 15 ■ ■ ■ ■ ¢

D

E

25 ■ ■ ■ ■ ■ ¢

F

G

■ ¢

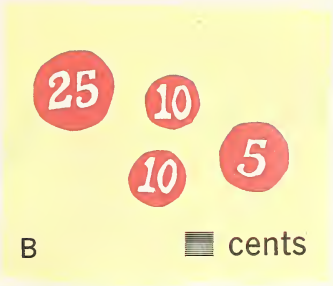
H

I

■ cents

J

A ____ ¢



B ____ cents

C ____ ¢

D ____ ¢

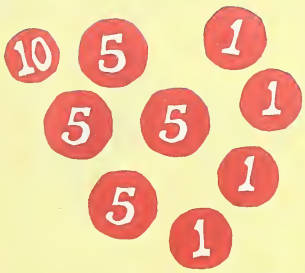
E ____ ¢

F ____ cents

G ____ cents

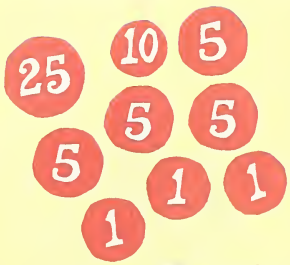
H ____ ¢

I ____ ¢



J ____ ¢

K ____ ¢



L ____ cents

MONEY
Finding values represented by sets of coins

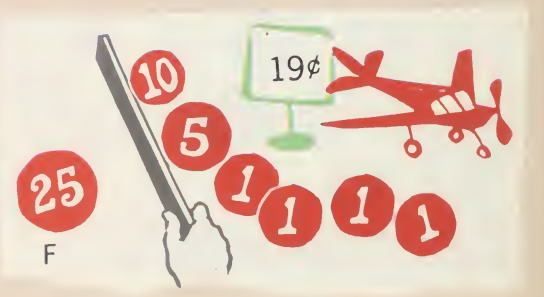
35¢
10
25
10
5
1
A

35¢
25
10
10
5
1
B

7¢
10
5
1
1
10
1
1
C

7¢
10
1
10
1
5
1
1
D

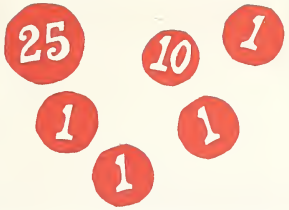
19¢
25
1
5
10
1
1
1
E


19¢
10
25
5
1
1
1
F

25¢
10
25
5
10
10
G

25¢
25
10
5
10
10
H

A ____¢



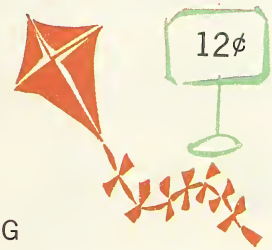
B ____ cents

C ____ cents

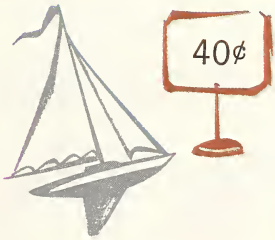
D ____¢

E ____ cents

F ____¢



G



H

I

J

K

L

MONEY
Selection of coins for specified total values

A

7 8 9 10¢

B

C

20 25¢

D

E

23 24 25 30¢

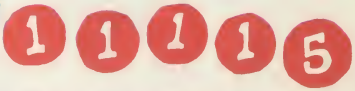
F

G

4 ■ ■ ■¢

H

I



■ ■ ■ ■ ■ ■¢

J

5
1¢

A

1
1
1
1
10

B

25
10¢

C

10
5
25
10
5

D

25
10
28¢

E

1
1
5
1
1
5
1

F

10
10
10
25¢

G

1
1
5
1
1
1
1

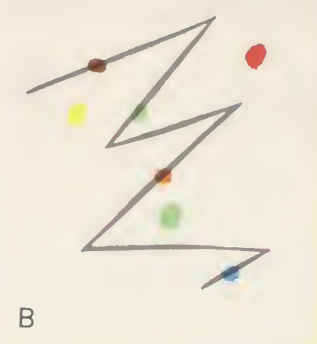
H

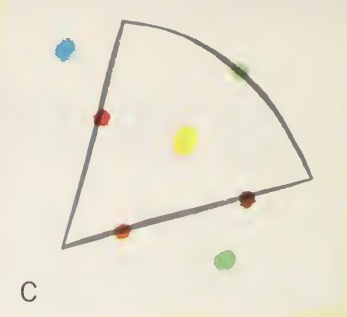
25
8¢

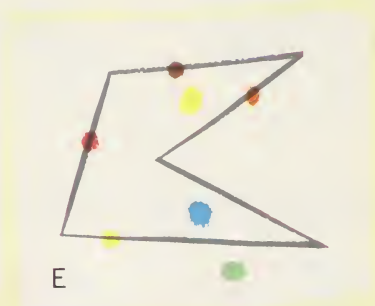
I

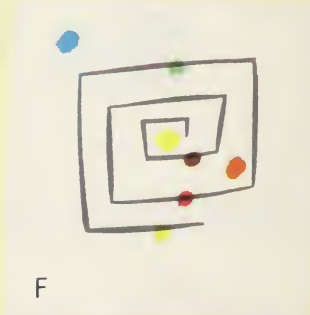
1
1
1
5
10
5
10
5

J





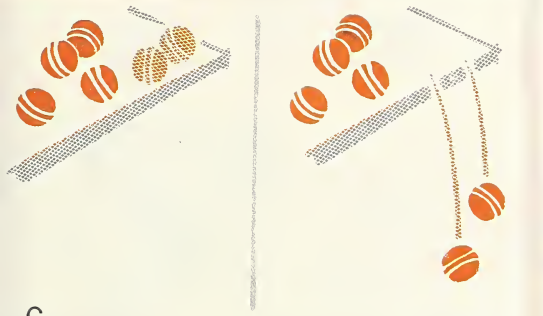




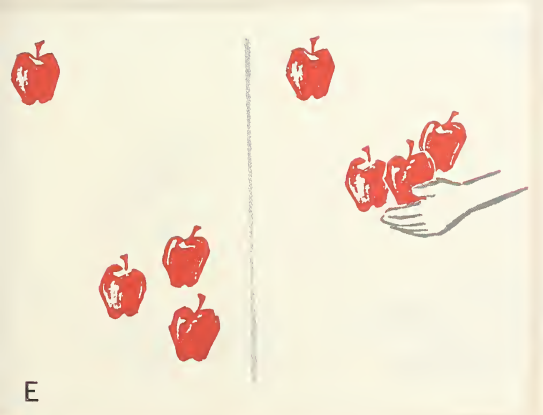
A 8 is one greater than ▢.
B 63 is one greater than ▢.
C ▢ is one greater than 5.
D ▢ is one greater than 72.
E 46 is one less than ▢.
F 74 is one less than ▢.
G ▢ is one less than 20.
H ▢ is one less than 82.
I ▢ is one greater than 38.
J 14 is one greater than ▢.
K ▢ is one less than 81.
L 77 is one less than ▢.
M ▢ is one greater than 39.

A ▢ is between 26 and 28.
B ▢ is between 81 and 83.
C 64 is between ▢ and 65.
D 11 is between ▢ and 12.
E 36 is between 35 and ▢.
F 43 is between 42 and ▢.
G 80 is between ▢ and 81.
H ▢ is between 14 and 16.
I 59 is between 58 and ▢.
J 22 is between 21 and ▢.
K ▢ is between 77 and 79.
L 51 is between ▢ and 52.
M ▢ is between 29 and 31.

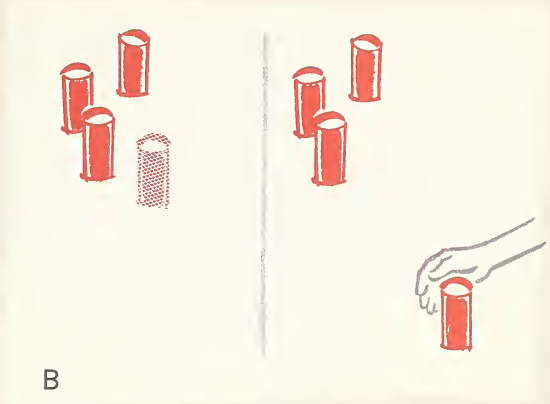
A



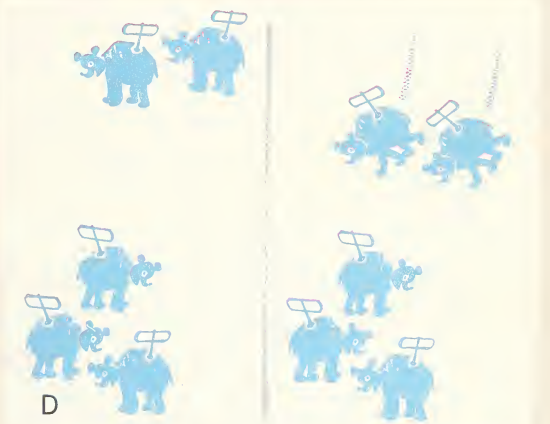
C



E



B



D

F

A

B

C

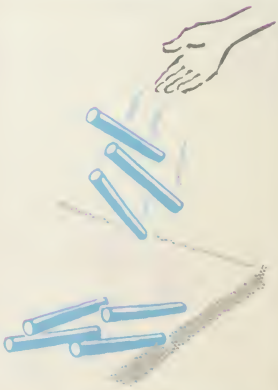
D

E

F

G

H



I

3

4

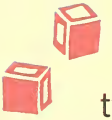
three plus four

3+4

A

2

1



two plus one

2+1

B

4

2

four plus two

4+2

C

2

3

two plus three

2+3

D

A 5

2

five minus two

5 – 2

B 3

1

three minus one

3 – 1

C 7

3

seven minus three

7 – 3

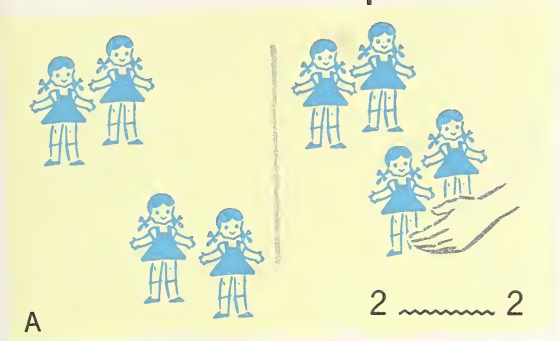
D 5

4

five minus four

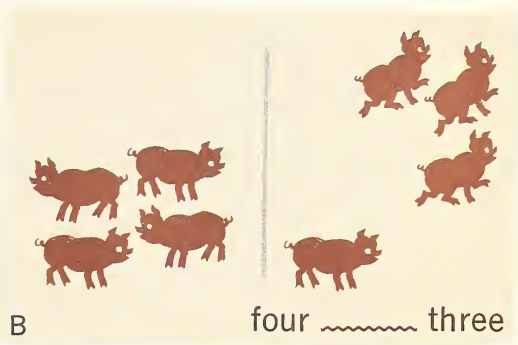
5 – 4

minus plus + −



A

2 ~~~~~ 2

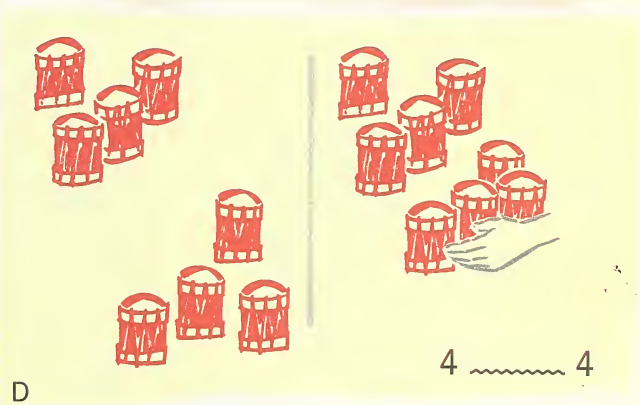


B

four ~~~~~ three

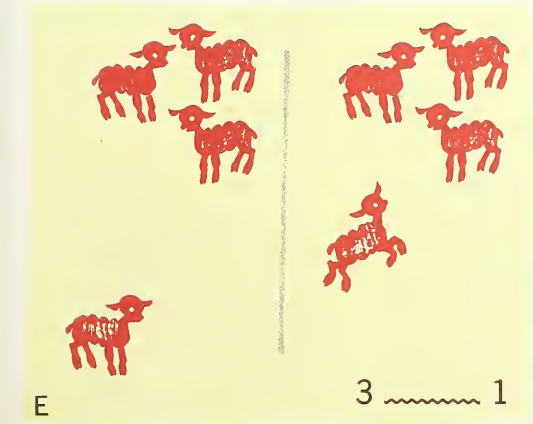
C

five ~~~~~ one



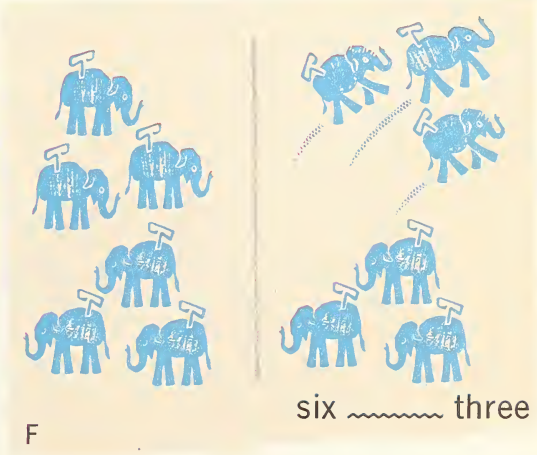
D

4 ~~~~~ 4



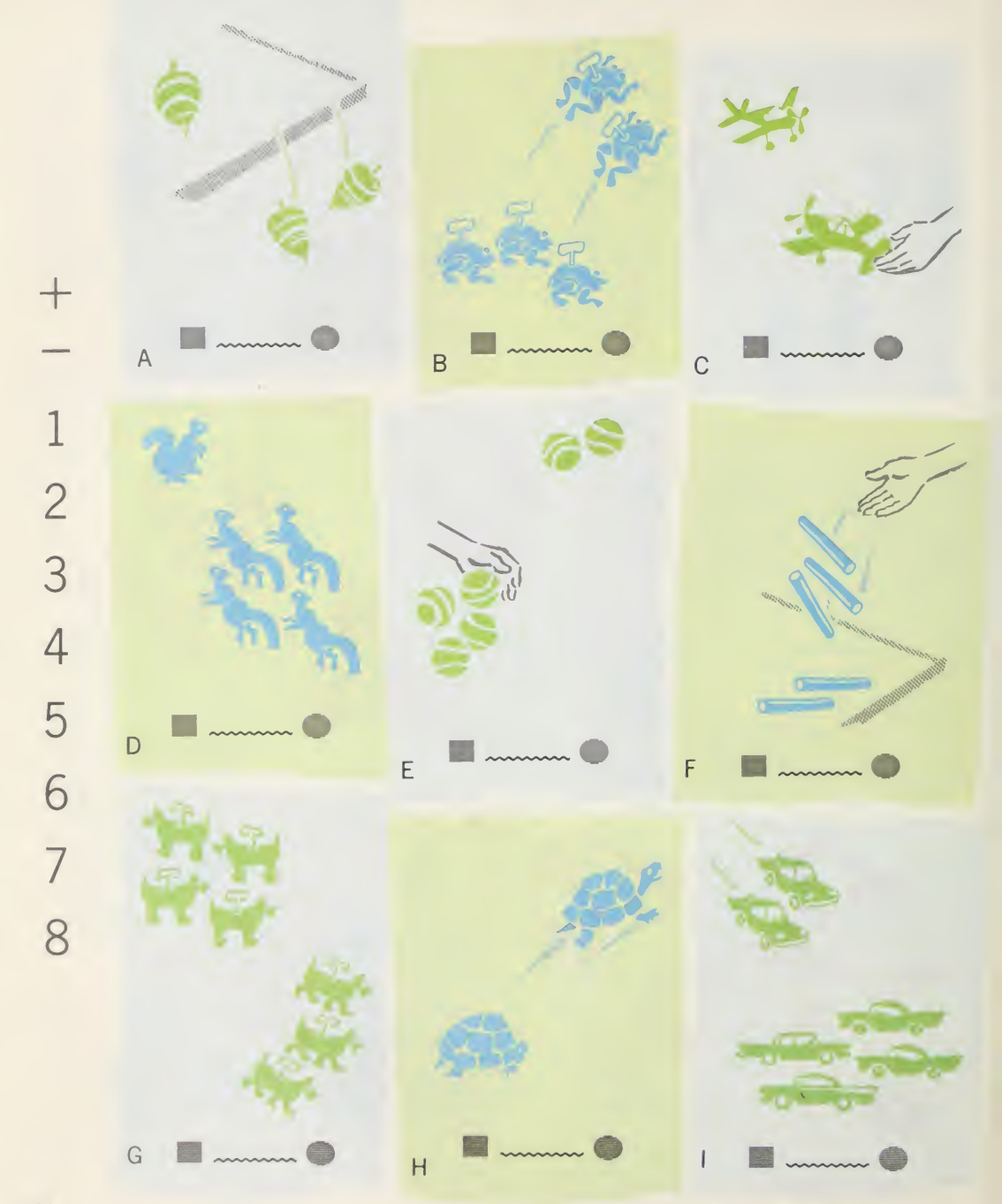
E

3 ~~~~~ 1

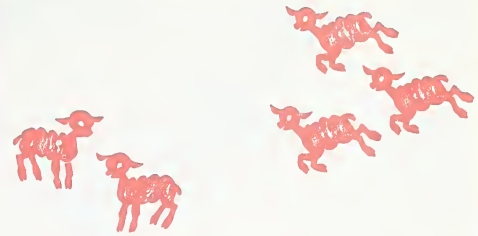


F

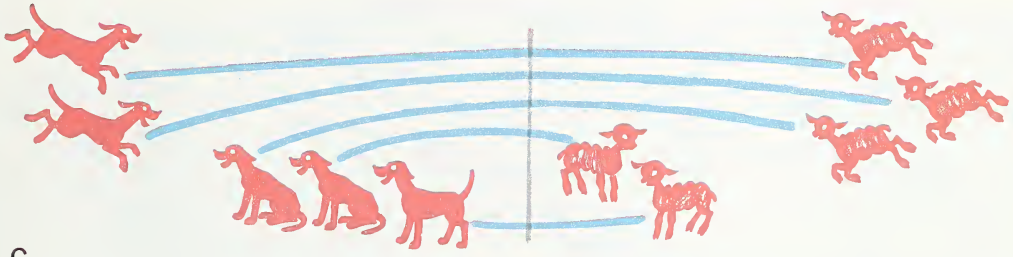
six ~~~~~ three


+
−
1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
H
I

A 3+2



B 2+3



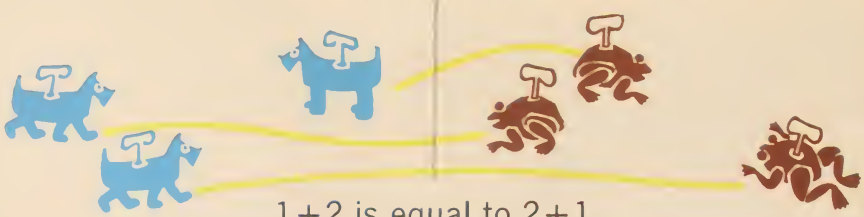
C

3+2 is equal to 2+3.

D 1+4

E 4+1

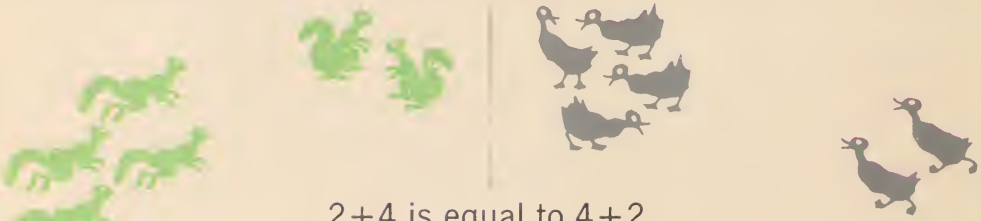
F 1+4 is equal to 4+1.



1+2 is equal to 2+1.

1+2=2+1

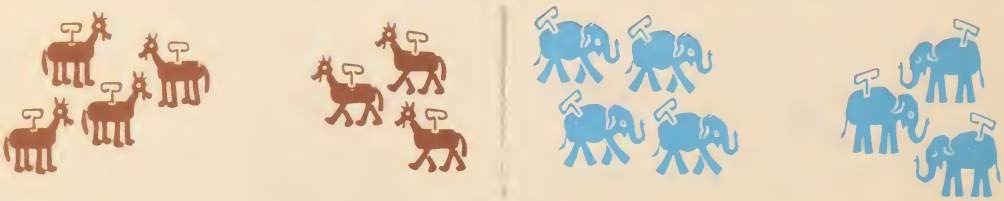
A



2+4 is equal to 4+2.

2+4=4+2

B



4+3 is equal to 3+ ▢.

4+3=3+ ▢

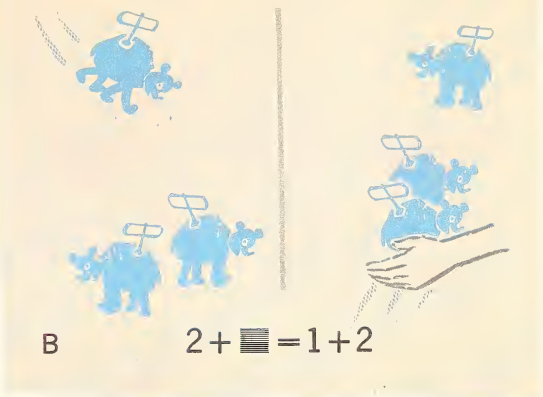
C

3+1 is equal to _____.

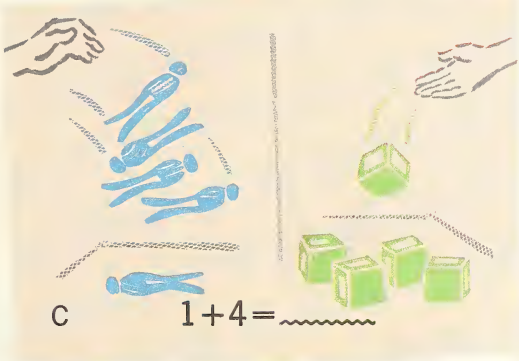
3+1=_____

D

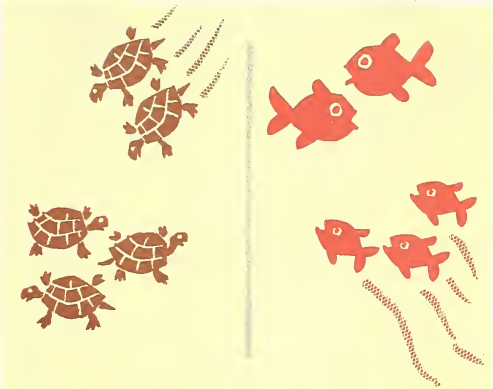
A $4+3=3+\square$



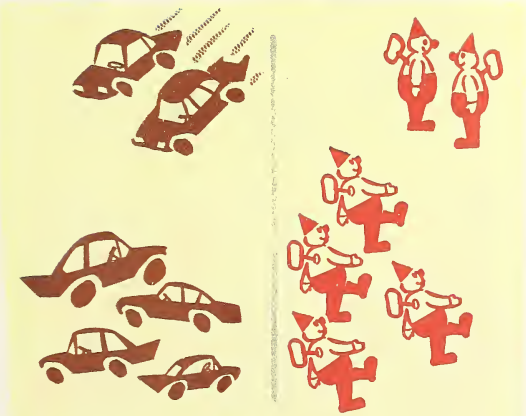
B $2+\square=1+2$



C $1+4=____$



D $____=2+3$

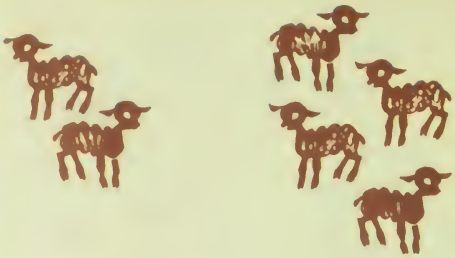


E $4+\square=____$

F $____=3+\square$

$1+\square=2+1$

A



$2+4=\square+2$

B

$____=3+4$

C

$1+3=____$

D

E $2+\square=____$

$____=3+\square$

F

$____=\square+3$

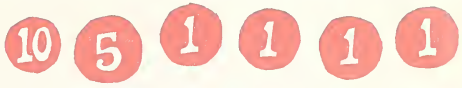
G

$\square+1=____$

H

25 35 ▢ ▢ ▢ cents

A

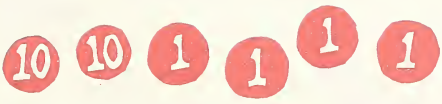


10 ▢ ▢ ▢ ▢ ▢ ¢

B

C ▢ ¢

D ▢ cents



E ▢ cents

F ▢ cents

G ▢ ¢

H ▢ cents

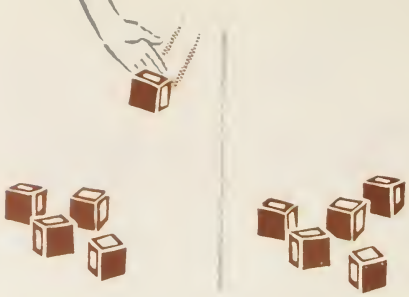
I ▢ ¢

J ▢ ¢

KEEPING SKILFUL
Finding values represented by sets of coins

$1+4=5$

A



$4+1=5$

B

$2+3=5$

C

$3+2=5$

D

$\blacksquare + \bullet = 5$

E

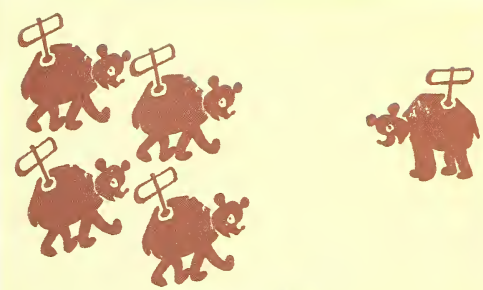
$\blacksquare + \bullet = 5$

F

A $4+1=\square$

B $2+3=\square$

C $3+2=\square$



D $1+4=\square$

E $\square+\bigcirc=5$

F $\square+\bigcirc=5$

G $\square+\bigcirc=5$

H $\square+\bigcirc=5$

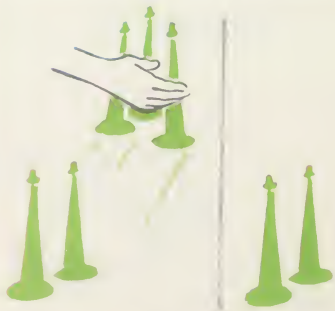
A $5-1=4$

B $5-4=1$

C $5-3=2$

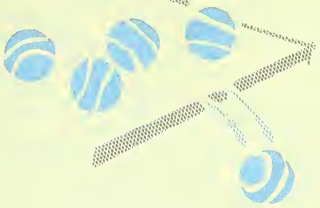
D $5-2=3$

E $\square-\bigcirc=1$



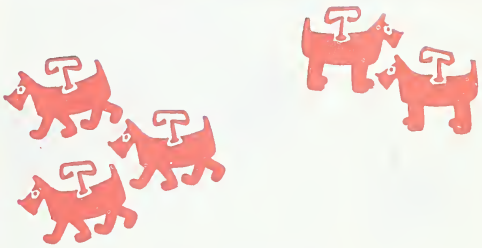
F $\square-\bigcirc=2$

A $5-2=\square$

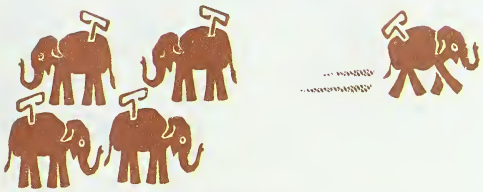


B $5-1=\square$

C $5-4=\square$



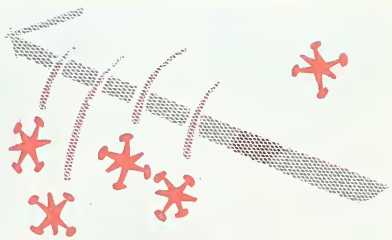
D $5-3=\square$



E $\square-\bigcirc=4$

F $\square-\bigcirc=3$

G $\square-\bigcirc=2$



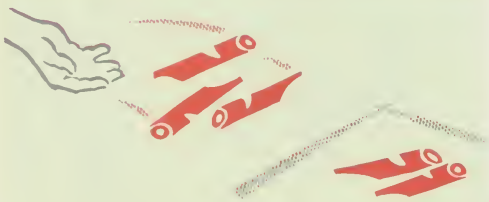
H $\square-\bigcirc=1$

A $5-3=\square$

B $\square+\bigcirc=5$

C $\square-\bigcirc=4$

D $5-4=\square$

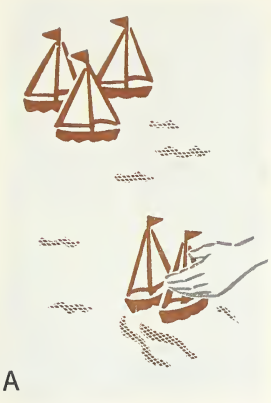


E $2+3=\square$

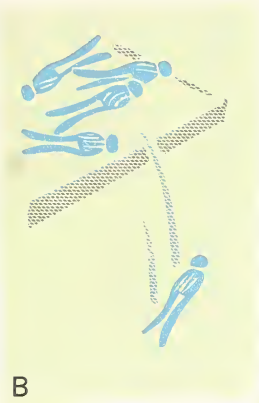
F $\square+\bigcirc=5$

G $5-2=\square$

H $\square+\bigcirc=5$



A



B

C

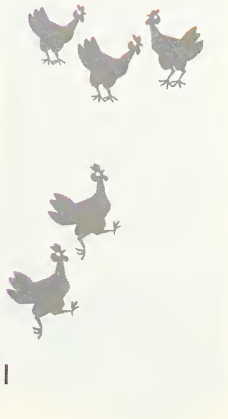
D

E

F

G

H



I

A $5-2=$ ▒

B $1+4=$ ▒

C $5-3=$ ▒

D $5-1=$ ▒

E $2+3=$ ▒

F $4+1=$ ▒

G $3+2=$ ▒

H $5-4=$ ▒

I $5-3=$ ▒

J $4+1=$ ▒

K $5-2=$ ▒

L $5-1=$ ▒

M $3+2=$ ▒

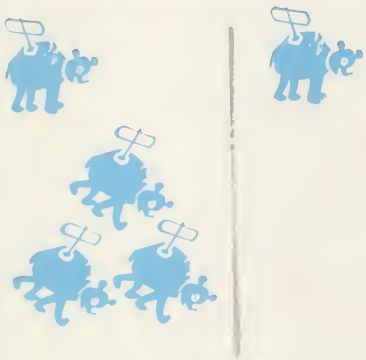
N $1+4=$ ▒

O $2+3=$ ▒

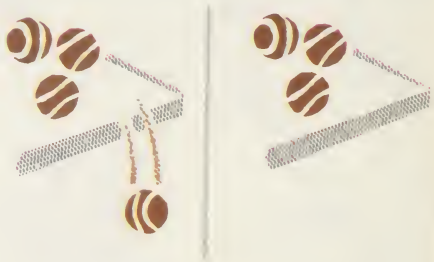
P $5-4=$ ▒

A $1+3=4$

B $3+1=4$



C $4-3=1$



D $4-1=3$

E $2+2=4$

F $4-2=2$

$4-3=\square$

A

$3+1=\square$

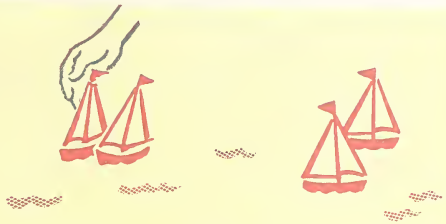
B

$4-2=\square$

C

$1+3=\square$

D



$2+2=\square$

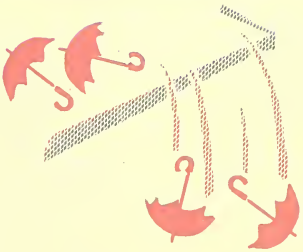
E

$4-1=\square$

F

$\square+\bigcirc=4$

G



$\square-\bigcirc=2$

H

A $4-2=\square$

B $1+3=\square$

C $5-1=\square$

D $2+3=\square$

E $4-3=\square$

F $2+2=\square$

G $3+1=\square$

H $5-2=\square$

I $4-1=\square$

J $5-4=\square$

K $3+1=\square$

L $5-3=\square$

M $4-2=\square$

N $1+3=\square$

O $4-1=\square$

P $3+2=\square$

Q $2+2=\square$

R $1+4=\square$

S $4-3=\square$

T $4+1=\square$

A

B

C

D

E

F

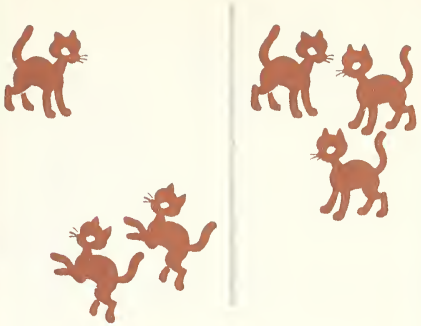
G

H

I

A

$2+1=3$

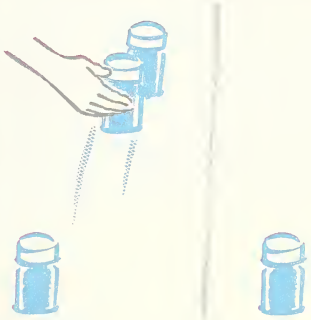


B

$1+2=3$

C

$3-1=2$



D

$3-2=1$

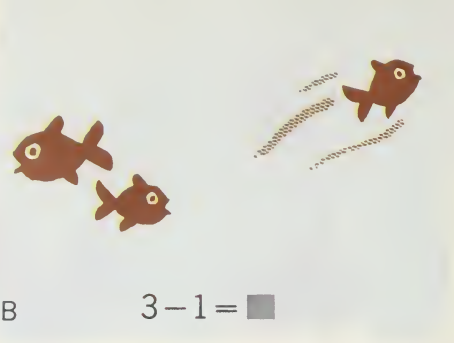
E

$1+1=2$

F

$2-1=1$

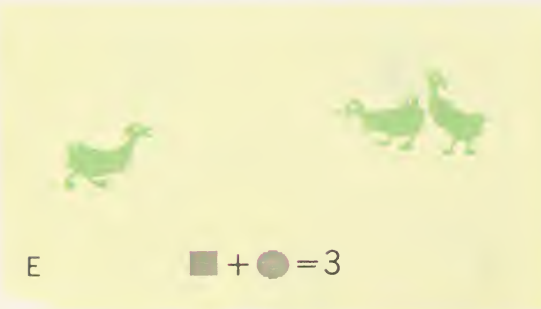
A $1+2=\square$



B $3-1=\square$

C $\square-\bigcirc=1$

D $\square-\bigcirc=1$

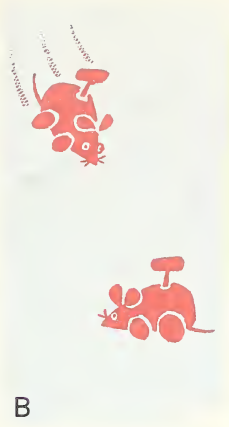


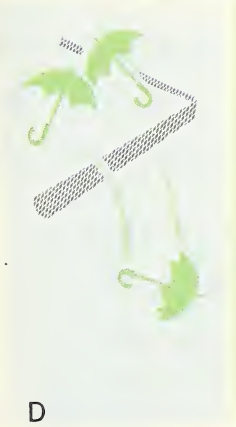
E $\square+\bigcirc=3$

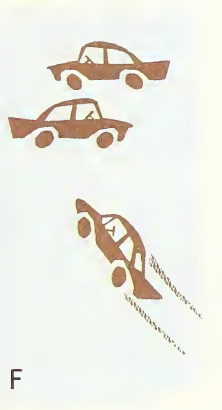
F $1+1=\square$

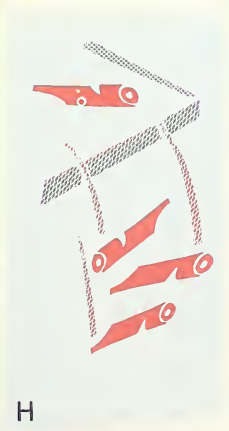
G $\square+\bigcirc=3$

H $3-1=\square$









A $2+1=$ ▒
B $2+3=$ ▒
C $3-2=$ ▒
D $1+1=$ ▒
E $5-2=$ ▒
F $3-1=$ ▒
G $5-4=$ ▒
H $1+3=$ ▒
I $4-3=$ ▒
J $1+2=$ ▒
K $2-1=$ ▒
L $1+4=$ ▒
M $1+1=$ ▒
N $3+1=$ ▒
O $4-2=$ ▒
P $3-1=$ ▒
Q $2+2=$ ▒
R $5-1=$ ▒
S $1+2=$ ▒
T $4-1=$ ▒
U $3+2=$ ▒
V $2-1=$ ▒
W $2+1=$ ▒
X $5-3=$ ▒
Y $3-2=$ ▒
Z $4+1=$ ▒

A Two plus two is equal to ■.
B Five minus four is equal to ■.
C Three minus one is equal to ■.
D Three plus two is equal to ■.
E Four minus one is equal to ■.

F Two plus one is equal to ■.
G Five minus three is equal to ■.
H Three minus two is equal to ■.
I One plus four is equal to ■.
J Four minus three is equal to ■.

K Four plus one is equal to ■.
L One plus one is equal to ■.
M One plus three is equal to ■.
N Four minus two is equal to ■.
O Five minus one is equal to ■.

P Two minus one is equal to ■.
Q Three plus one is equal to ■.
R Five minus two is equal to ■.
S One plus two is equal to ■.
T Two plus three is equal to ■.

A $5-2=$ ■
B $3+1=$ ■
C $2-1=$ ■
D $1+4=$ ■
E $4-2=$ ■

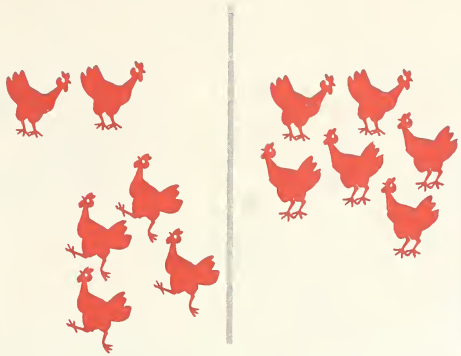
F $3-2=$ ■
G $2+3=$ ■
H $4-1=$ ■
I $2+1=$ ■
J $5-4=$ ■

K $4+1=$ ■
L $3-1=$ ■
M $2+2=$ ■
N $5-3=$ ■
O $1+2=$ ■

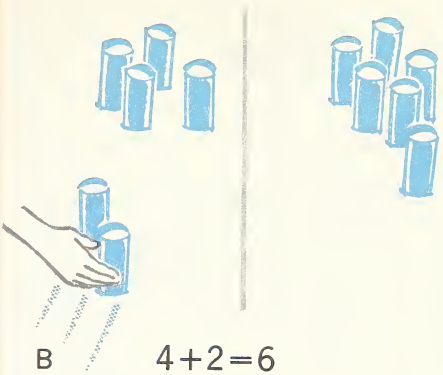
P $4-3=$ ■
Q $5-1=$ ■
R $3+2=$ ■
S $1+1=$ ■
T $1+3=$ ■

A ■ is between 6 and 8.
B ■ is between 11 and 13.
C ■ is between 54 and 56.
D ■ is between 79 and 81.
E 46 is between ■ and 47.
F 93 is between ■ and 94.
G 68 is between ■ and 69.
H 21 is between ■ and 22.

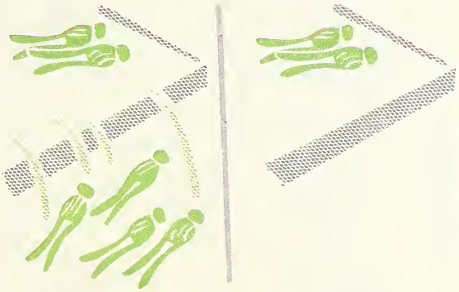
I 75 is between ■ and 76.
J 19 is between ■ and 20.
K 2 is between 1 and ■.
L 84 is between 83 and ■.
M 15 is between 14 and ■.
N 40 is between 39 and ■.
O 77 is between 76 and ■.
P 39 is between 38 and ■.



A 2+4=6

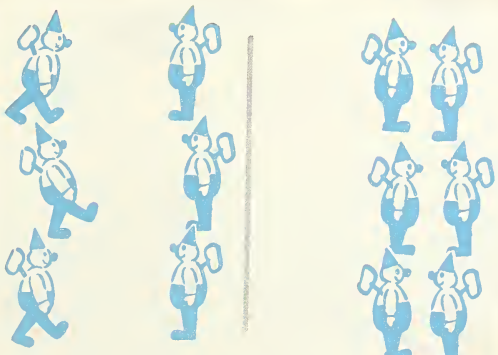


B 4+2=6

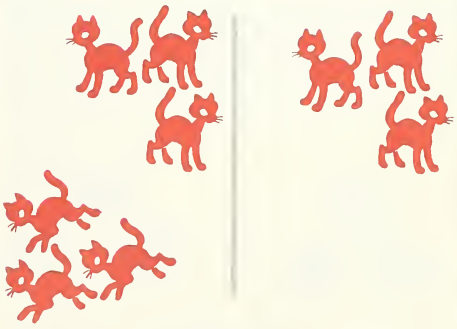


C 6−4=2

D 6−2=4

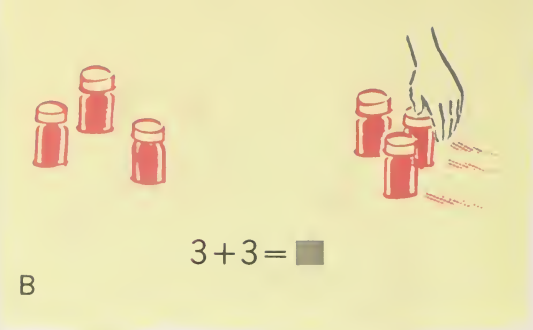


E 3+3=6



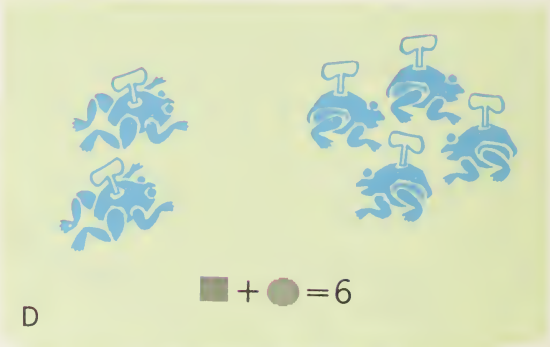
F 6−3=3

A $6-4=\square$

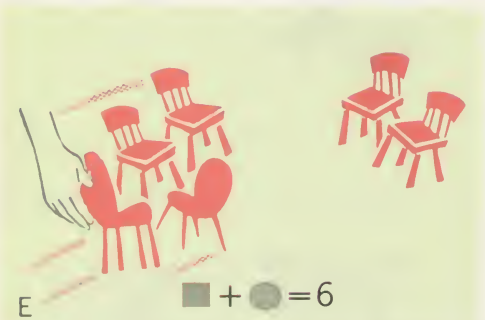


B $3+3=\square$

C $6-3=\square$

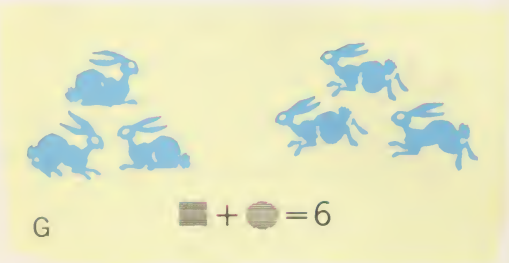


D $\square+\bigcirc=6$



E $\square+\bigcirc=6$

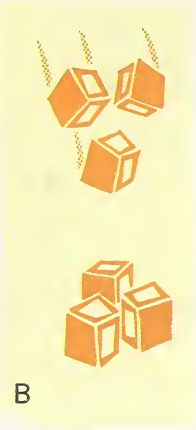
F $\square-\bigcirc=2$



G $\square+\bigcirc=6$

H $6-2=\square$

A


B

C

D

E

F

G

H

I

A $5-1=$ ▒

B $2+4=$ ▒

C $6-2=$ ▒

D $3+3=$ ▒

E $1+4=$ ▒

F $3-1=$ ▒

G $2+3=$ ▒

H $6-4=$ ▒

I $2+1=$ ▒

J $4+2=$ ▒

K $6-3=$ ▒

L $3+2=$ ▒

M $4-3=$ ▒

N $2-1=$ ▒

O $3+3=$ ▒

P $5-4=$ ▒

Q $4-1=$ ▒

R $6-2=$ ▒

S $1+2=$ ▒

T $2+4=$ ▒

U $6-3=$ ▒

V $3-2=$ ▒

W $4+2=$ ▒

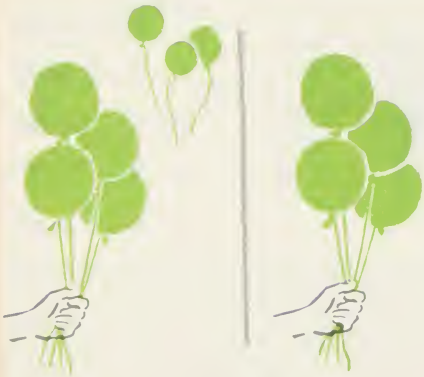
X $2+2=$ ▒

Y $6-4=$ ▒

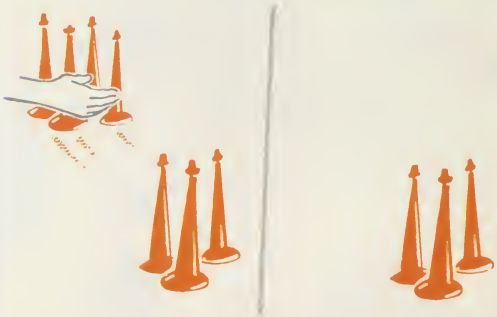
Z $1+1=$ ▒

A $4+3=7$

B $3+4=7$



C $7-3=4$

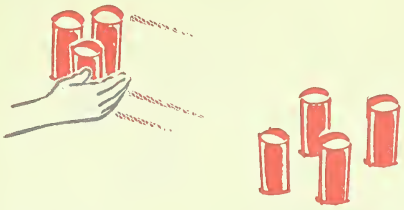


D $7-4=3$

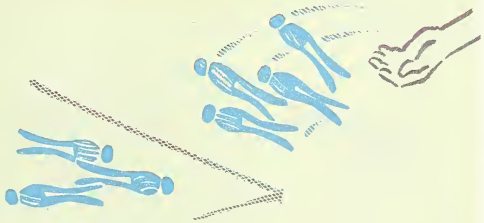
E $4+4=8$

F $8-4=4$

A $4+4=\square$

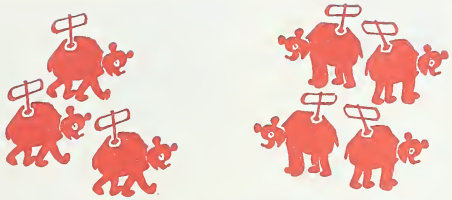


B $7-3=\square$

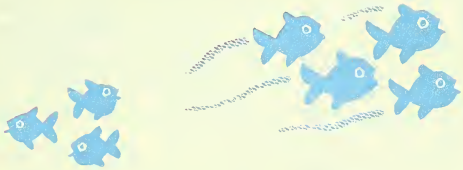


C $\square+\bigcirc=7$

D $\square-\bigcirc=4$



E $\square+\bigcirc=7$



F $7-4=\square$

G $\square-\bigcirc=4$

H $3+4=\square$

A $3-1=$ ■

B $2+4=$ ■

C $7-3=$ ■

D $6-2=$ ■

E $4+4=$ ■

F $7-4=$ ■

G $3+1=$ ■

H $4+3=$ ■

I $5-2=$ ■

J $4+2=$ ■

K $8-4=$ ■

L $3+4=$ ■

M $2+3=$ ■

N $6-3=$ ■

O $4+3=$ ■

P $4-2=$ ■

Q $1+3=$ ■

R $4+4=$ ■

S $5-3=$ ■

T $8-4=$ ■

U $7-3=$ ■

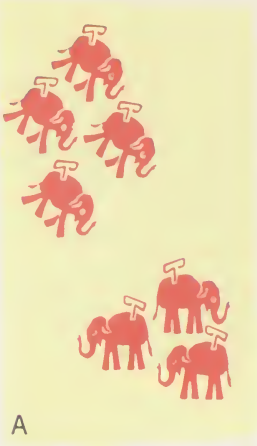
V $3+3=$ ■

W $6-4=$ ■

X $3+4=$ ■

Y $4+1=$ ■

Z $7-4=$ ■

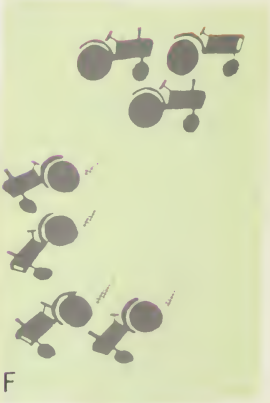

A

B

C

D

E


F

G

H

I

A Five minus four is equal to ▭.
B Four plus four is equal to ▭.
C Four minus one is equal to ▭.
D Seven minus four is equal to ▭.
E Four plus two is equal to ▭.

F Four plus three is equal to ▭.
G One plus four is equal to ▭.
H Six minus three is equal to ▭.
I Three plus two is equal to ▭.
J Six minus four is equal to ▭.

K Three plus three is equal to ▭.
L Seven minus three is equal to ▭.
M Two plus two is equal to ▭.
N Two plus four is equal to ▭.
O Four minus three is equal to ▭.

P Eight minus four is equal to ▭.
Q Five minus one is equal to ▭.
R Three plus four is equal to ▭.
S Six minus two is equal to ▭.
T One plus two is equal to ▭.

A $6-4=$▭	E $4+4=$▭	I $3+2=$▭	M $4+1=$▭	Q $7-3=$▭
B $3+4=$▭	F $4-2=$▭	J $4+3=$▭	N $8-4=$▭	R $5-3=$▭
C $1+3=$▭	G $7-3=$▭	K $5-4=$▭	O $3-2=$▭	S $3+1=$▭
D $3-1=$▭	H $1+4=$▭	L $6-2=$▭	P $1+1=$▭	T $2+4=$▭

A $4-1=$▭	E $2+1=$▭	I $5-4=$▭	M $7-4=$▭	Q $2-1=$▭
B $7-4=$▭	F $5-2=$▭	J $8-4=$▭	N $5-1=$▭	R $2+2=$▭
C $2+3=$▭	G $4+3=$▭	K $1+2=$▭	O $4+2=$▭	S $6-3=$▭
D $4+4=$▭	H $1+1=$▭	L $3+3=$▭	P $4-3=$▭	T $3+4=$▭

A $1+2=2+$▭	E ▭$+3=3+2$	I $4+3=$▭$+$●
B $3+$▭$=4+3$	F $1+4=$▭$+1$	J ▭$+$●$=3+2$
C $1+$▭$=3+1$	G $2+4=$▭●	K ▭$+$●$=1+4$
D $4+2=$▭$+4$	H ▭$+$●$=1+2$	L $3+1=$▭$+$●

A

B

C

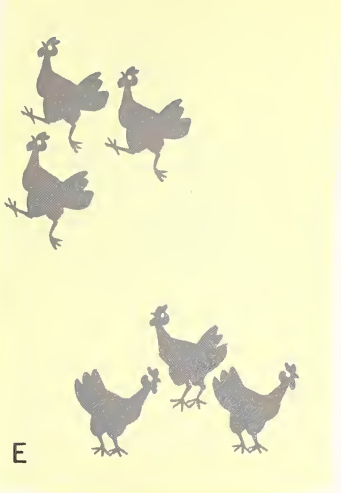
G

H

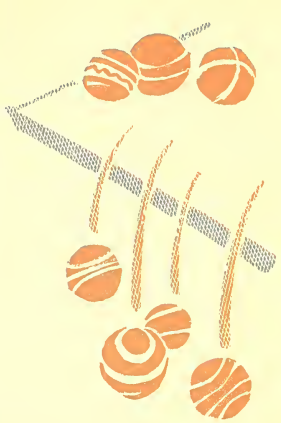
I

1	2	3	4
2−1	1+1	1+2	1+3
3−2	3−1	2+1	2+2
4−3	4−2	4−1	3+1
5−4	5−3	5−2	5−1
	6−4	6−3	6−2
		7−4	7−3
			8−4

D

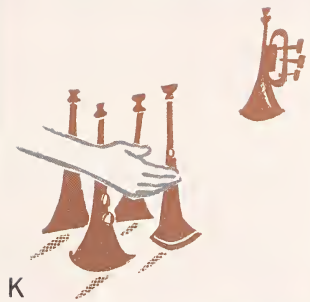


E



F

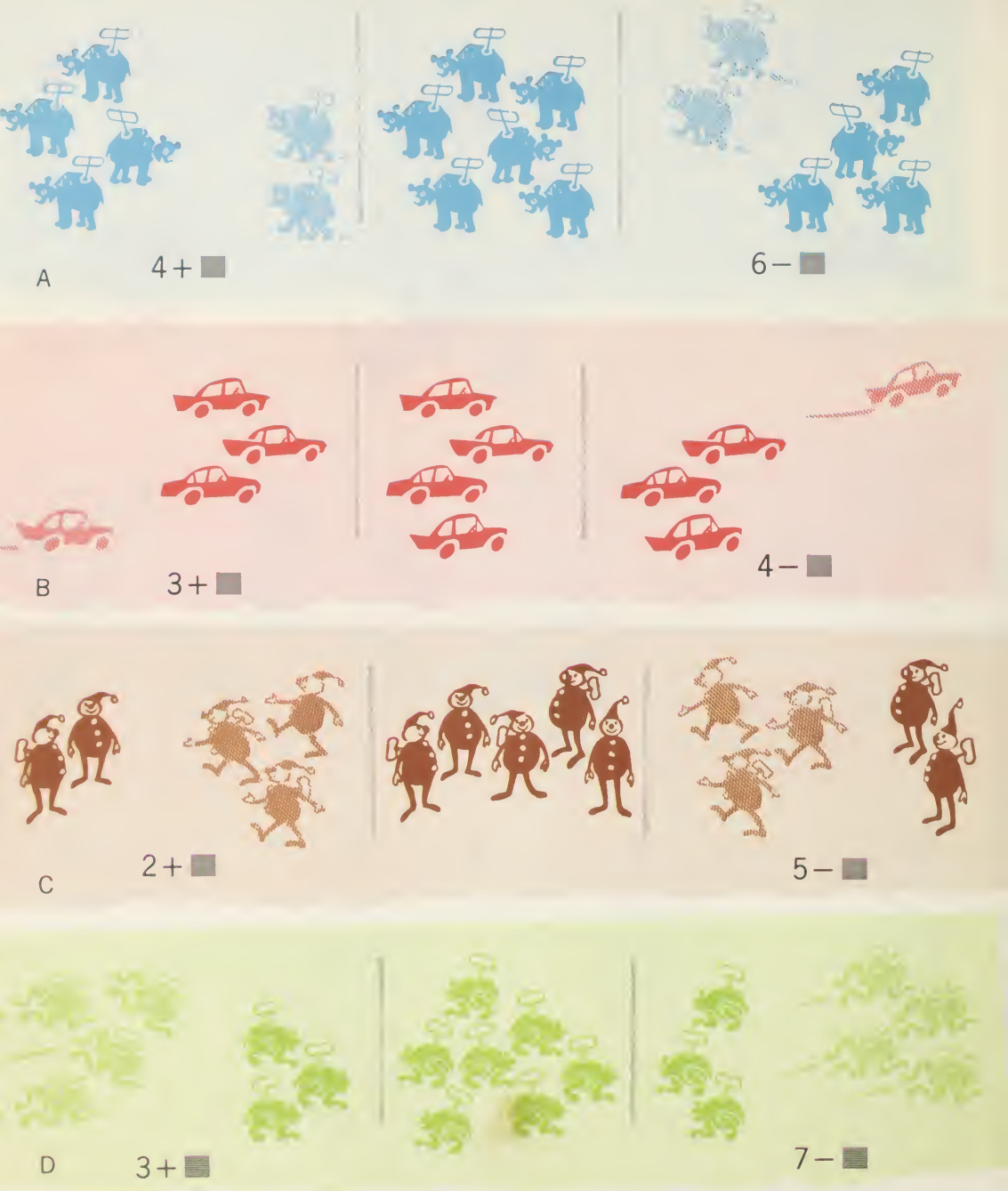
J



K

L

5	6	7	8
1+4	2+4	3+4	4+4
2+3	3+3	4+3	
3+2	4+2		
4+1			

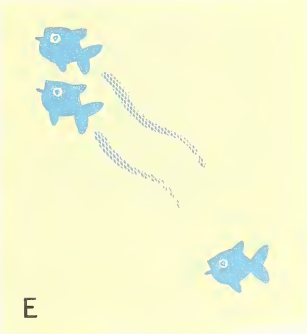

A
4 + ■
6 − ■
B
3 + ■
4 − ■
C
2 + ■
5 − ■
D
3 + ■
7 − ■

A

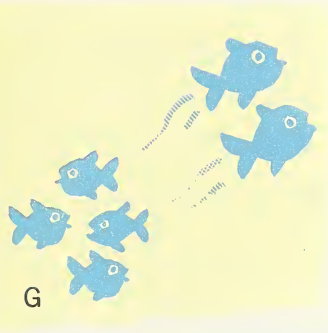
B

C

D


E

F


G

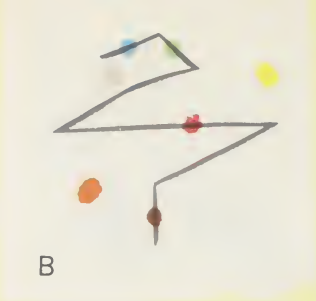
H

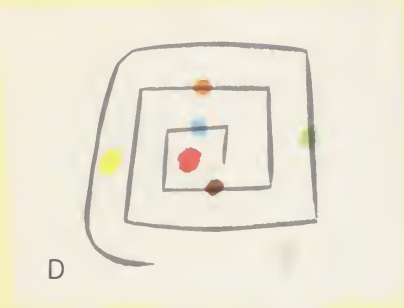
I

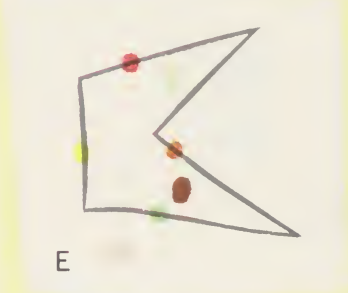
J

K

L







is equal to	is less than	is greater than
A 3 ____ 11.	**F** 85 ____ 58.	**K** 98 ____ 89.
B 10 ____ 20.	**G** 90 ____ 90.	**L** 66 ____ 62.
C 34 ____ 28.	**H** 46 ____ 64.	**M** 71 ____ 71.
D 18 ____ 18.	**I** 38 ____ 78.	**N** 41 ____ 14.
E 25 ____ 29.	**J** 52 ____ 93.	**O** 79 ____ 97.

A 14 is one greater than ■.

B ■ is one greater than 95.

C 22 is one less than ■.

D ■ is one less than 48.

E 31 is one greater than ■.

F ■ is one greater than 54.

G 30 is one less than ■.

H 88 is one greater than ■.

I 73 is one greater than ■.

J ■ is one greater than 79.

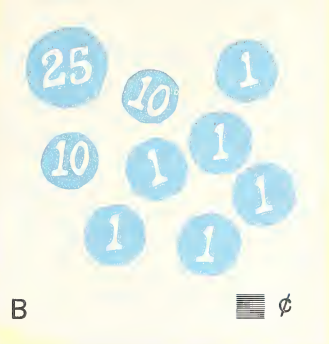
K ■ is one less than 70.

L 94 is one less than ■.

KEEPING SKILFUL

Curves—interior, exterior, betweenness; ideas of "greater than," "less than," and "equal to"

A ▭ cents



B ▭ ¢

C ▭ ¢

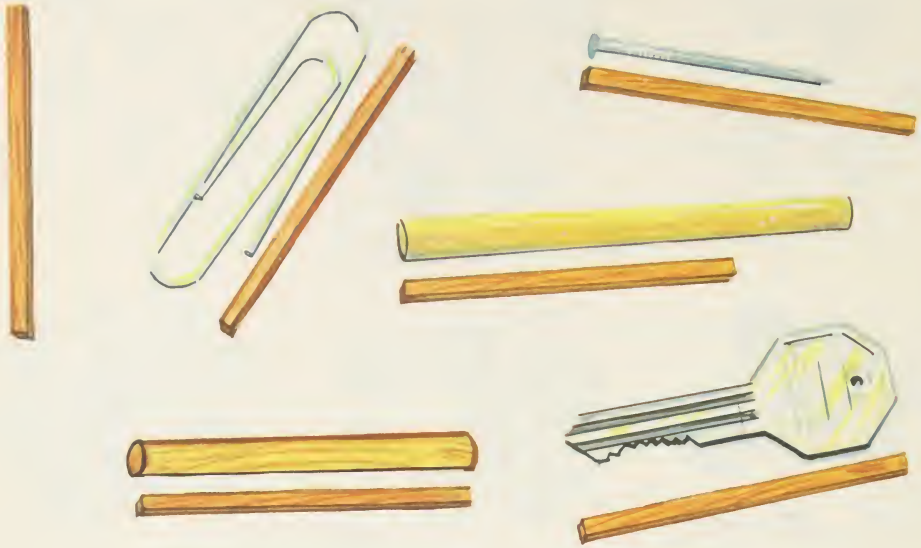
D ▭ cents

E ▭ ¢

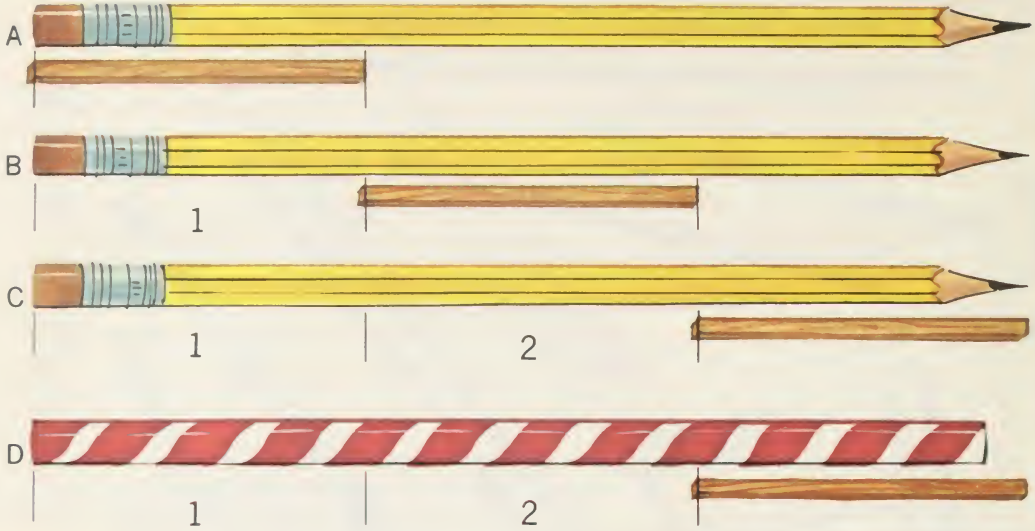
F ▭ cents

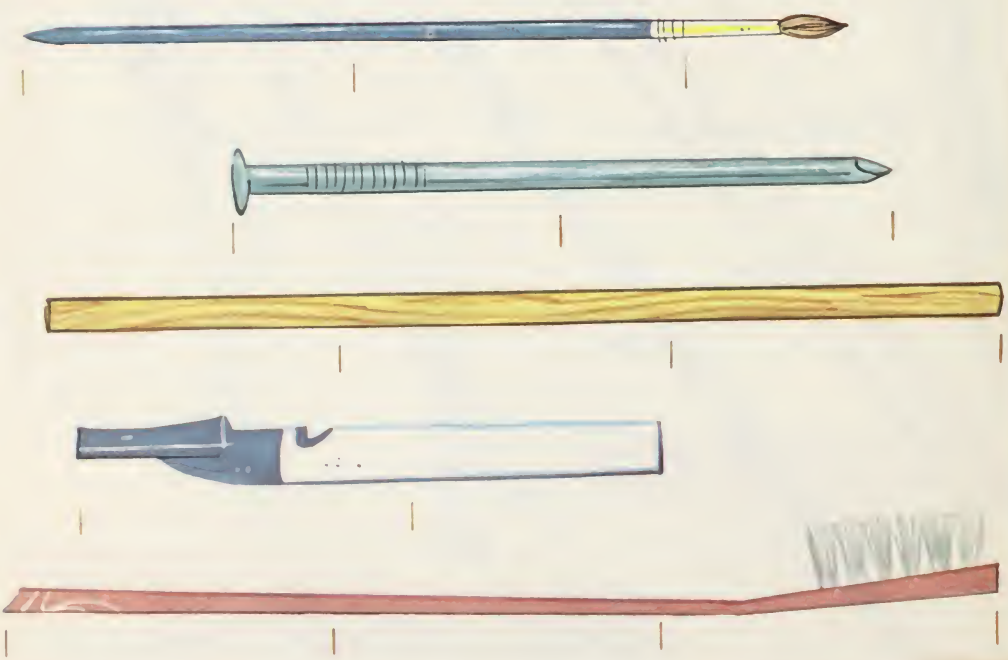
A ▭ is between 8 and 10.
B 82 is between ▭ and 83.
C ▭ is between 66 and 68.
D 44 is between 43 and ▭.
E 26 is between 25 and ▭.
F 13 is between ▭ and 14.
G 51 is between ▭ and 52.
H ▭ is between 94 and 96.
I 78 is between ▭ and 79.
J 39 is between 38 and ▭.
K ▭ is between 55 and 57.
L 50 is between 49 and ▭.

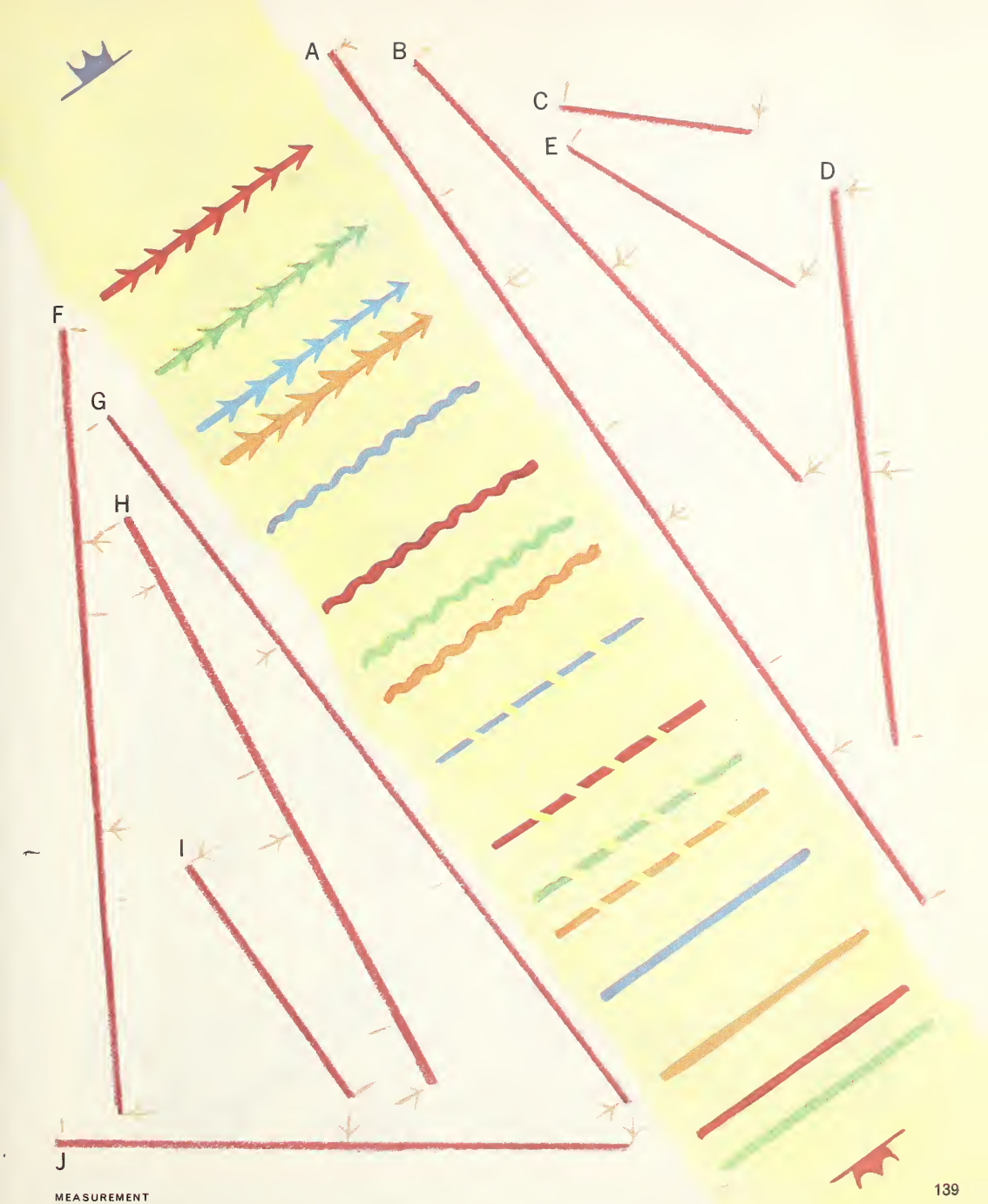
A 9 tens 2 ones ▭
B 4 tens 5 ones ▭
C 6 tens 8 ones ▭
D 2 tens 3 ones ▭
E 5 tens 9 ones ▭
F 7 tens 6 ones ▭
G 54 5 tens ◯ ones
H 87 ▭ tens ◯ ones
I 35 ▭ tens ◯ ones
J 99 ▭ tens ◯ ones
K 63 ▭ tens ◯ ones
L 42 ▭ tens ◯ ones



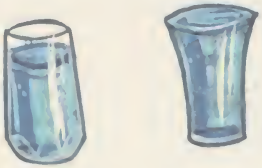
MEASUREMENT
Linear—use of several copies of a unit of measure in a given situation


A
B
1
C
1
2
D
1
2

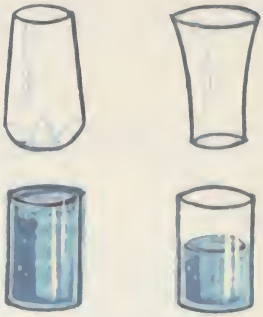




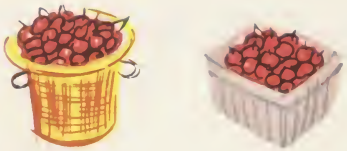
MEASUREMENT
Linear—judgment relating to precision



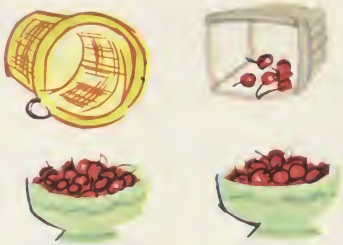
A



B



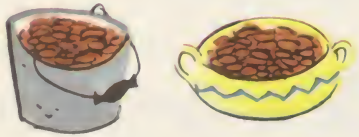
C



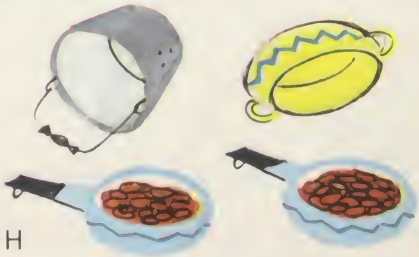
D

E

F

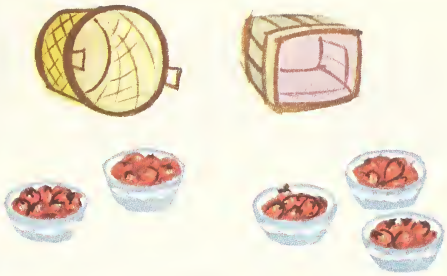


G



H

A



B

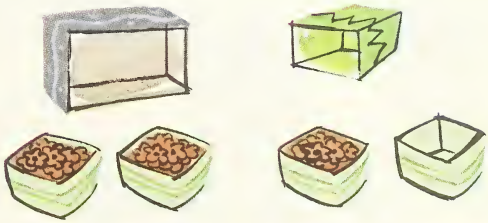
C

D

E

F

G



H

A
B
C
D
E
F
G
H

A

B

C

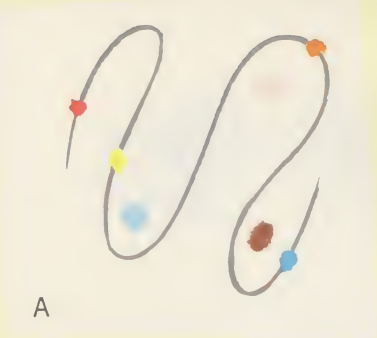
D

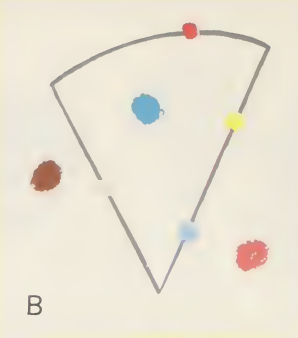
E

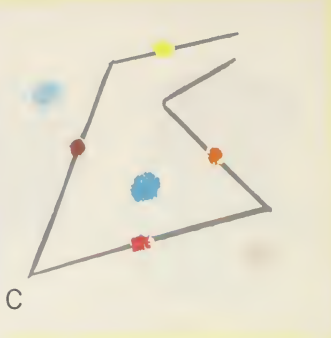
F

G

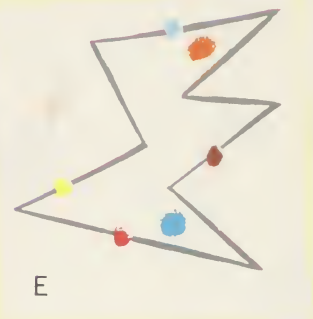
H


A


B


C

D


E

F

10
5
10
10
5
10
1
10
5
G
¢

25
10
10
1
1
1
1
H
¢

5
5
25
5
1
5
1
1
I
¢

10
10
5
10
5
25
5
5
5
5
J
¢

10
25
1
1
10
10
1
1
10
1
K
¢

5
25
10
10
5
1
10
5
1
10
L
¢

is less than

A 47 ⟋⟍ 96.
B 21 ⟋⟍ 21.
C 9 ⟋⟍ 10.
D 17 ⟋⟍ 7.
E 56 ⟋⟍ 65.
F 72 ⟋⟍ 99.
G 48 ⟋⟍ 46.

is equal to

H 92 ⟋⟍ 92.
I 80 ⟋⟍ 8.
J 43 ⟋⟍ 34.
K 77 ⟋⟍ 77.
L 35 ⟋⟍ 53.
M 14 ⟋⟍ 12.
N 29 ⟋⟍ 29.

is greater than

O 82 ⟋⟍ 92.
P 68 ⟋⟍ 65.
Q 11 ⟋⟍ 11.
R 75 ⟋⟍ 57.
S 41 ⟋⟍ 49.
T 28 ⟋⟍ 24.
U 80 ⟋⟍ 70.

is one greater than

A 7 ⟋⟍ 8.
B 59 ⟋⟍ 58.
C 14 ⟋⟍ 13.
D 46 ⟋⟍ 47.
E 79 ⟋⟍ 80.
F 6 ⟋⟍ 5.

G 96 ⟋⟍ 95.
H 21 ⟋⟍ 22.
I 30 ⟋⟍ 29.
J 76 ⟋⟍ 75.
K 87 ⟋⟍ 88.
L 54 ⟋⟍ 55.

is one less than

M 60 ⟋⟍ 61.
N 94 ⟋⟍ 95.
O 57 ⟋⟍ 56.
P 39 ⟋⟍ 40.
Q 71 ⟋⟍ 70.
R 29 ⟋⟍ 28.

A ▭ is between 7 and 9.
B ▭ is between 21 and 23.
C ▭ is between 55 and 57.
D 78 is between ▭ and 79.
E 45 is between ▭ and 46.
F 80 is between ▭ and 81.
G 13 is between 12 and ▭.
H 34 is between 33 and ▭.
I 67 is between 66 and ▭.
J 91 is between 90 and ▭.

K 32 is between ▭ and 33.
L 16 is between 15 and ▭.
M ▭ is between 90 and 92.
N 27 is between ▭ and 28.
O 71 is between ▭ and 72.
P ▭ is between 66 and 68.
Q 89 is between 88 and ▭.
R 54 is between 53 and ▭.
S ▭ is between 49 and 51.
T 60 is between ▭ and 61.

A 46 ■ tens ● ones

B 92 ■ tens ● ones

C 29 ■ tens ● ones

D 73 ■ tens ● ones

E 58 ■ tens ● ones

F 65 ■ tens ● ones

G 33 ■ tens ● ones

H 24 ■ tens ● ones

I 87 ■ tens ● ones

J 95 ■ tens ● ones

K 42 ■ tens ● ones

L 78 ■ tens ● ones

M 3 tens 4 ones ■

N 7 tens 5 ones ■

O 6 tens 9 ones ■

P 9 tens 6 ones ■

Q 2 tens 3 ones ■

R 8 tens 2 ones ■

S 4 tens 8 ones ■

T 5 tens 7 ones ■

U 3 tens 6 ones ■

V 6 tens 3 ones ■

W 2 tens 5 ones ■

X 9 tens 4 ones ■

A $6-4=$ ■ E $7-3=$ ■ I $4-3=$ ■ M $8-4=$ ■ Q $2+3=$ ■

B $4+4=$ ■ F $2+1=$ ■ J $2+4=$ ■ N $3-2=$ ■ R $4-2=$ ■

C $5-1=$ ■ G $3+3=$ ■ K $5-3=$ ■ O $3+1=$ ■ S $3+4=$ ■

D $3+2=$ ■ H $7-4=$ ■ L $4+1=$ ■ P $6-2=$ ■ T $2-1=$ ■

A $4+3=$ ■ E $6-3=$ ■ I $3+4=$ ■ M $2+3=$ ■ Q $1+2=$ ■

B $5-2=$ ■ F $1+1=$ ■ J $5-4=$ ■ N $4-2=$ ■ R $7-4=$ ■

C $2+2=$ ■ G $8-4=$ ■ K $3-1=$ ■ O $4+2=$ ■ S $5-2=$ ■

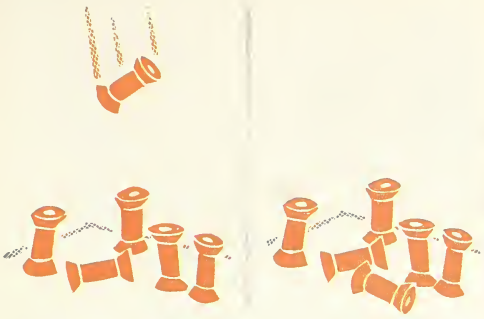
D $1+4=$ ■ H $1+3=$ ■ L $7-3=$ ■ P $4-1=$ ■ T $4+4=$ ■

A $3+1=1+$ ■ E $1+$ ■ $=4+1$ I ■ $+$ ● $=3+4$

B ■ $+4=4+3$ F ■ $+3=3+2$ J $1+3=$ ■ $+$ ●

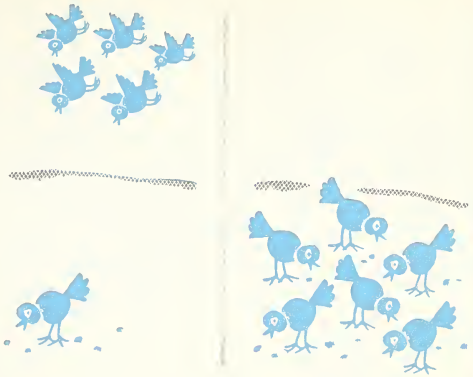
C $4+$ ■ $=2+4$ G ■ $+$ ● $=1+2$ K ■ $+$ ● $=2+3$

D $1+2=$ ■ $+1$ H $2+4=$ ■ $+$ ● L $4+1=$ ■ $+$ ●

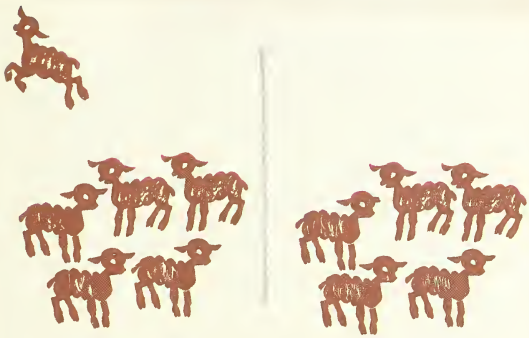


5+1=6

A

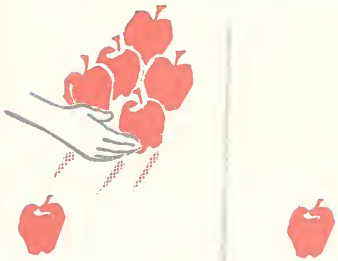


B 1+5=6



6−1=5

C



D 6−5=1

■+●=6

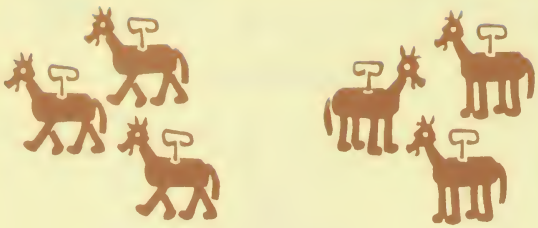
E

■−●=5

F

A $4+2=\square$

B $6-1=\square$



C $6-3=\square$

D $\square+\bigcirc=6$

E $\square+\bigcirc=6$

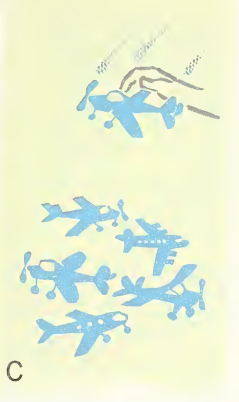
F $6-2=\square$

G $2+4=\square$

H $\square-\bigcirc=1$

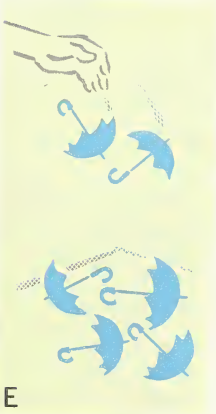
A

B



C

D



E

F

G

H

I

A $6-2=$ ▒

B $5+1=$ ▒

C $1+1=$ ▒

D $2+4=$ ▒

E $6-5=$ ▒

F $5+1=$ ▒

G $2+4=$ ▒

H $6-3=$ ▒

I $1+5=$ ▒

J $5-2=$ ▒

K $3-1=$ ▒

L $4+2=$ ▒

M $3+2=$ ▒

N $6-1=$ ▒

O $2-1=$ ▒

P $3+3=$ ▒

Q $4-2=$ ▒

R $6-5=$ ▒

S $2+3=$ ▒

T $5-4=$ ▒

U $1+5=$ ▒

V $6-4=$ ▒

W $3+3=$ ▒

X $6-1=$ ▒

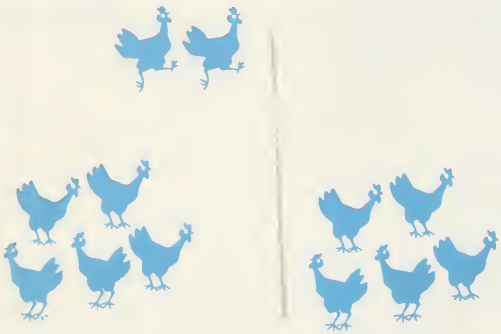
Y $5-3=$ ▒

Z $6-2=$ ▒

EXTENSION
Sums and minuends of 2 through 6

A $5+2=7$

B $2+5=7$



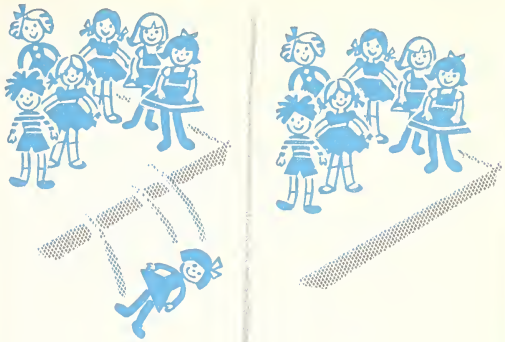
C $7-2=5$

D $7-5=2$

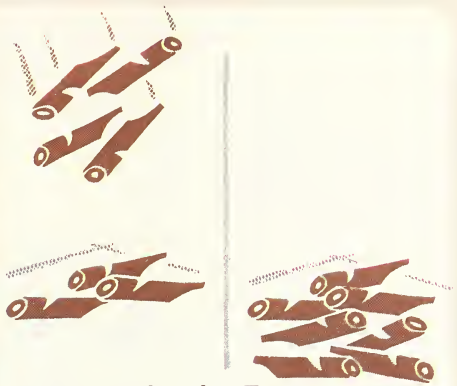
E $1+6=7$

F $6+1=7$

A $7-6=1$

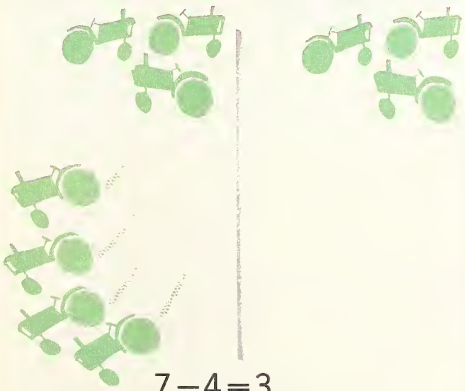


B $7-1=6$



C $3+4=7$

D $4+3=7$

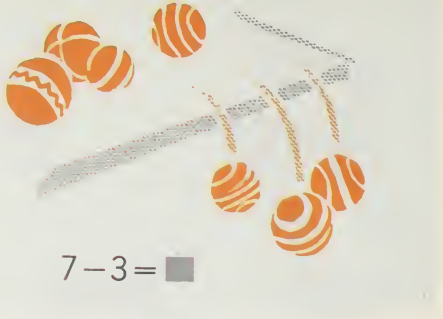


E $7-4=3$

F $7-3=4$

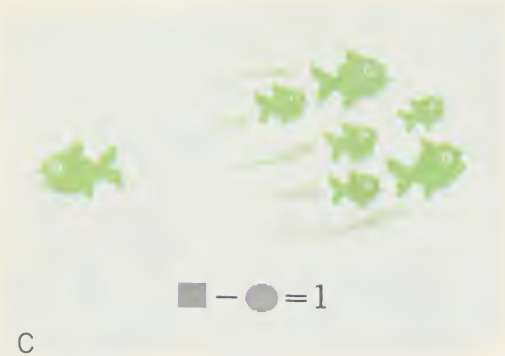
■ + ● = 7

A



7 − 3 = ■

B



■ − ● = 1

C

■ + ● = 7

D

3 + 4 = ■

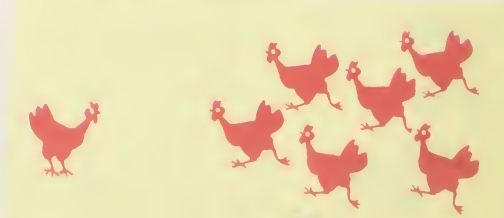
E

7 − 1 = ■

F

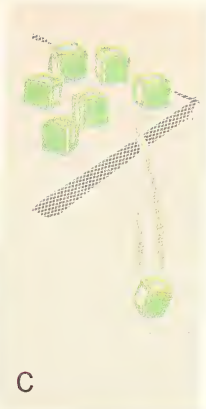
■ − ● = 2

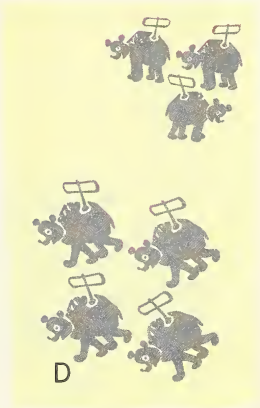
G

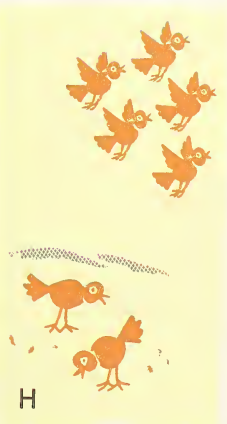


1 + 6 = ■

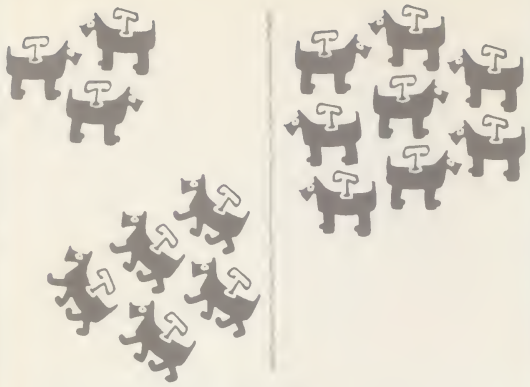
H







A $7-6=$ ▩
B $5+2=$ ▩
C $6-1=$ ▩
D $7-5=$ ▩
E $6+1=$ ▩
F $7-3=$ ▩
G $2+5=$ ▩
H $6-4=$ ▩
I $7-1=$ ▩
J $3+4=$ ▩
K $5+1=$ ▩
L $1+6=$ ▩
M $4+3=$ ▩
N $7-2=$ ▩
O $7-6=$ ▩
P $4+3=$ ▩
Q $6-5=$ ▩
R $5+2=$ ▩
S $1+6=$ ▩
T $7-5=$ ▩
U $1+5=$ ▩
V $7-1=$ ▩
W $2+5=$ ▩
X $7-4=$ ▩
Y $6+1=$ ▩
Z $7-2=$ ▩



A $3+5=8$

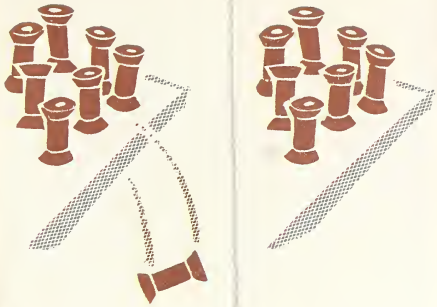
B $5+3=8$

C $8-5=3$

D $8-3=5$

E $7+1=8$

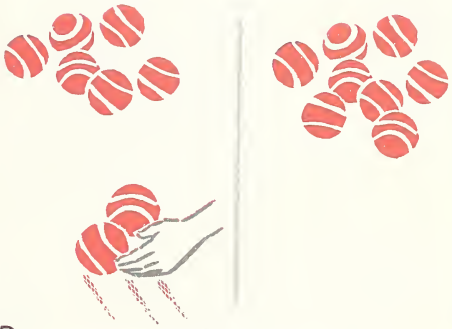
F $1+7=8$



A $8-1=7$

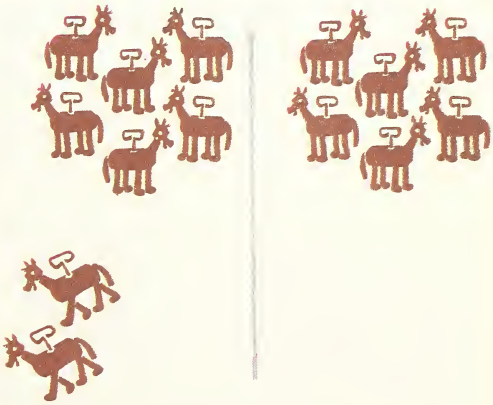
B $8-7=1$

C $2+6=8$

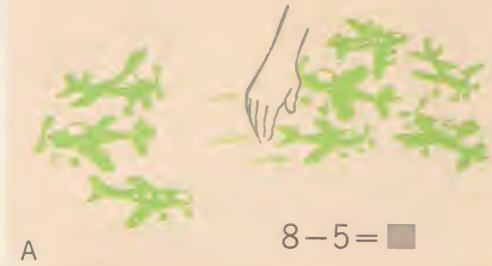


D $6+2=8$

E $8-6=2$

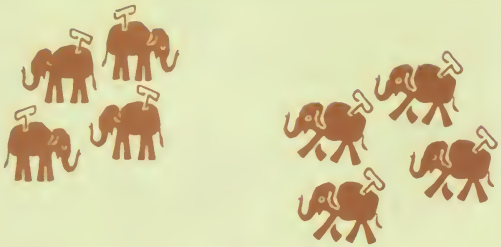


F $8-2=6$



A $8-5=\square$

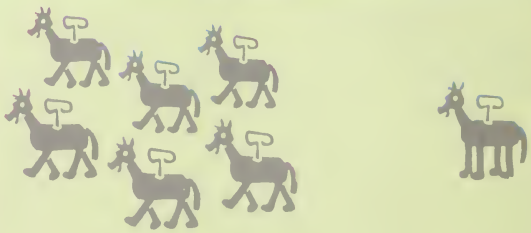
B $7+1=\square$



C $\square+\bigcirc=8$

D $8-2=\square$

E $\square-\bigcirc=1$

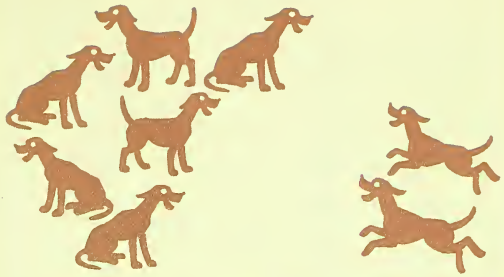


F $\square-\bigcirc=1$

G $2+6=\square$

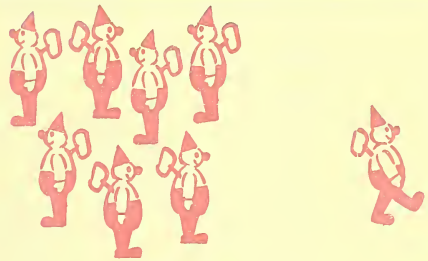
H $\square+\bigcirc=8$

A $\square - \bigcirc = 5$



B $6 + 2 = \square$

C $\square + \bigcirc = 7$



D $\square - \bigcirc = 7$

E $8 - 6 = \square$

F $\square + \bigcirc = 8$

G $8 - 4 = \square$

H $1 + 7 = \square$

A $4+4=$ ■

B $7-2=$ ■

C $8-1=$ ■

D $6+2=$ ■

E $8-3=$ ■

F $8-6=$ ■

G $3+5=$ ■

H $6-5=$ ■

I $7+1=$ ■

J $8-5=$ ■

K $8-2=$ ■

L $7-1=$ ■

M $5+3=$ ■

N $8-6=$ ■

O $8-4=$ ■

P $3+4=$ ■

Q $6+2=$ ■

R $1+5=$ ■

S $8-3=$ ■

T $7-6=$ ■

U $3+5=$ ■

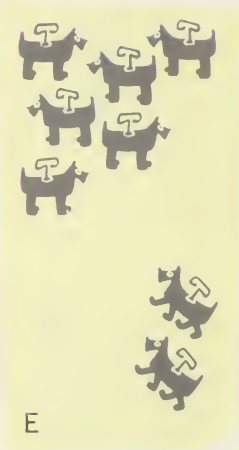
V $8-7=$ ■

W $2+6=$ ■

X $8-5=$ ■

Y $2+3=$ ■

Z $5+3=$ ■



A Seven minus five is equal to ▭.
B Eight minus six is equal to ▭.
C Five plus one is equal to ▭.
D Eight minus three is equal to ▭.
E Three plus five is equal to ▭.

F One plus seven is equal to ▭.
G Five plus two is equal to ▭.
H Six minus one is equal to ▭.
I Eight minus one is equal to ▭.
J One plus six is equal to ▭.

K Two plus five is equal to ▭.
L Six minus five is equal to ▭.
M Five plus three is equal to ▭.
N Six plus one is equal to ▭.
O Eight minus seven is equal to ▭.

P Seven minus two is equal to ▭.
Q One plus five is equal to ▭.
R Six plus two is equal to ▭.
S Seven minus six is equal to ▭.
T Eight minus five is equal to ▭.

A $3+5=$▭	E $7-5=$▭	I $7-3=$▭	M $2+5=$▭	Q $8-3=$▭
B $7-1=$▭	F $7+1=$▭	J $4+4=$▭	N $7-6=$▭	R $6+2=$▭
C $2+6=$▭	G $6-1=$▭	K $8-2=$▭	O $6-3=$▭	S $6-4=$▭
D $3+4=$▭	H $2+4=$▭	L $6+1=$▭	P $8-7=$▭	T $5+1=$▭

A $1+6=$▭	E $7-2=$▭	I $8-6=$▭	M $6-5=$▭	Q $7-1=$▭
B $3+3=$▭	F $8-4=$▭	J $4+3=$▭	N $2+6=$▭	R $5+2=$▭
C $8-2=$▭	G $1+5=$▭	K $8-1=$▭	O $7-4=$▭	S $8-5=$▭
D $7+1=$▭	H $4+2=$▭	L $5+3=$▭	P $6-2=$▭	T $1+7=$▭

A $2+5=5+$▭	E $2+6=$▭$+$◯	I $1+5=$▭$+$◯
B $1+$▭$=6+1$	F $7+1=$▭$+$◯	J ▭$+$◯$=2+4$
C ▭$+3=3+5$	G ▭$+$◯$=3+4$	K $3+5=$▭$+$◯
D $5+1=$▭$+5$	H ▭$+$◯$=2+5$	L ▭$+$◯$=1+6$

CHECKING UP
Sums and minuends of 2 through 8; commutative property of addition

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